

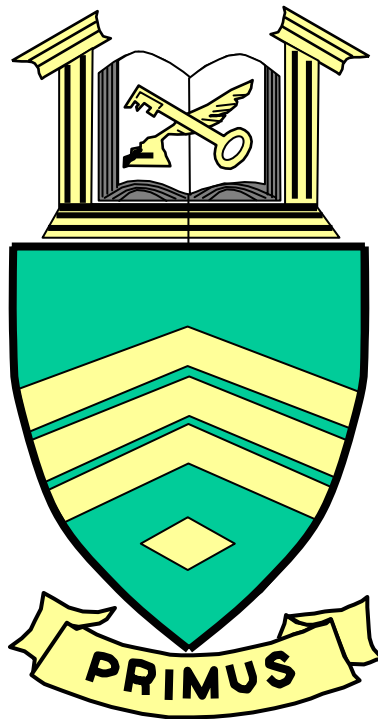
U.S. ARMY SERGEANTS MAJOR ACADEMY (FSC-TATS)

P661

JUN 04

MONITOR UNIT AND INDIVIDUAL FITNESS TRAINING
PROGRAMS

PRERESIDENT TRAINING SUPPORT PACKAGE



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PRERESIDENT TRAINING SUPPORT PACKAGE (TSP)

TSP Number / Title	P661 / MONITOR UNIT AND INDIVIDUAL FITNESS TRAINING PROGRAMS
Effective Date	01 Jun 2004
Supersedes TSP(s) / Lesson(s)	P661, Monitor unit and individual fitness training programs, Jun 01
TSP Users	521-SQIM (DL), First Sergeant Course
Proponent	The proponent for this document is the Sergeants Major Academy.
Improvement Comments	<p>Users are invited to send comments and suggested improvements on DA Form 2028, <i>Recommended Changes to Publications and Blank Forms</i>. Completed forms, or equivalent response, will be mailed or attached to electronic e-mail and transmitted to:</p> <p>COMDT USASMA ATTN ATSS DCF BLDG 11291 BIGGS FIELD FORT BLISS TX 79918-8002</p> <p>Telephone (Comm) (915) 568-8875 Telephone (DSN) 978-8875</p> <p>E-mail: atss-dcd@bliss.army.mil</p>
Security Clearance / Access	Unclassified
Foreign Disclosure Restrictions	FD5. This product/publication has been reviewed by the product developers in coordination with the USASMA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

PREFACE

Purpose

This Training Support Package provides the student with a standardized lesson plan for presenting instruction for:

Task Number**Task Title**

071-990-0007

Implement a Total Fitness Program in a Company

071-990-0009

Implement an Individual Total Fitness Program

This TSP
Contains

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MONITOR UNIT AND INDIVIDUAL FITNESS TRAINING PROGRAMS
P661 I / Version 1
01 Jun 2004

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson

<u>Course Number</u>	<u>Version</u>	<u>Course Title</u>
521-SQIM (DL)	1	First Sergeant Course

Task(s) Taught(*) or Supported

<u>Task Number</u>	<u>Task Title</u>
071-990-0007	Implement a Total Fitness Program in a Company
071-990-0009	Implement an Individual Total Fitness Program

Reinforced Task(s)

<u>Task Number</u>	<u>Task Title</u>
None	

Academic Hours

The academic hours required to teach this lesson are as follows:

	<u>Distance Learning Hours/Methods</u>
	1 hr 40 mins /Practical Exercise (Performance)
	2 hrs 10 mins /Study Assignment
Test	0 hrs
Test Review	0 hrs
Total Hours:	4 hrs

Test Lesson Number

	<u>Hours</u>	<u>Lesson No.</u>
Testing (to include test review)	3 hrs	E651 version 1

Prerequisite Lesson(s)

<u>Lesson Number</u>	<u>Lesson Title</u>
None	

Clearance Access

Security Level: Unclassified
Requirements: There are no clearance or access requirements for the lesson.

Foreign Disclosure Restrictions

FD5. This product/publication has been reviewed by the product developers in coordination with the USASMA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

References

<u>Number</u>	<u>Title</u>	<u>Date</u>	<u>Additional Information</u>
AR 350-1	ARMY TRAINING AND EDUCATION	09 Apr 2003	
FM 21-20	PHYSICAL FITNESS TRAINING	30 Sep 1992	

Student Study Assignments

- Read AR 350-1 (SH-1), pp SH-1-1 thru SH-1-7.
- Read FM 21-20 (SH-2), pp SH-2-1 thru SH-2-43.

Instructor Requirements

None

Additional Support Personnel Requirements

<u>Name</u>	<u>Stu Ratio</u>	<u>Qty</u>	<u>Man Hours</u>
MSG, FSC graduate, ITC, and SGITC graduate (Enlisted)	1:14	1	5 hrs

Equipment Required for Instruction

<u>Id</u> <u>Name</u>	<u>Stu Ratio</u>	<u>Instr Ratio</u>	<u>Spt</u>	<u>Qty</u>	<u>Exp</u>
None					

* Before Id indicates a TADSS

Materials Required

Instructor Materials:
None

Student Materials:

- P661.
- Pen or pencil and writing paper.

Classroom, Training Area, and Range Requirements

None

Ammunition Requirements

<u>Id</u>	<u>Name</u>	<u>Exp</u>	<u>Stu Ratio</u>	<u>Instr Ratio</u>	<u>Spt Qty</u>
None					

Instructional Guidance

None

**Proponent
Lesson Plan
Approvals**

<u>Name</u>	<u>Rank</u>	<u>Position</u>	<u>Date</u>
Colyer, Donald J.	GS09	Training Specialist	
Adams, Chris L.	SGM	Chief Instructor, FSC	
Graham, Kevin L.	MSG	Chief, FSC	
Gratton, Steven M.	SGM	Chief, Functional Courses	
Bucher, George V.	GS11	Chief, CMD	
Lemon, Marion	SGM	Chief, CDDD	

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SECTION II. INTRODUCTION

Method of Instruction: Study Assignment
Technique of delivery: Individualized, self-paced Instruction
Instructor to Student Ratio is: 1:14
Time of Instruction: 5 mins
Media: None

Motivator

The preservation of America's freedom is dependent on a strong defense. Our armed forces must be mentally and physically ready at all times, leaving no doubt about our nation's will and ability to defend itself. Commanders, First Sergeants, and supervisors are responsible for ensuring all soldiers in their units maintain the highest level of physical fitness. All leaders must plan, conduct, evaluate, and test physical training within their units. As leaders, your example should be a source of confidence and inspiration to your soldiers. A soldier's level of physical fitness has a direct impact on his combat readiness. In other words, if he's not physically and mentally fit, he's not supporting the Army's physical fitness objectives.

Terminal Learning Objective

At the completion of this lesson, you [the student] will:

Action:	Implement unit and individual fitness training programs.
Conditions:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).
Standards:	Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).

Safety Requirements

None

Risk Assessment Level

Low

Environmental Considerations

NOTE: It is the responsibility of all soldiers and DA civilians to protect the environment from damage.

None

Evaluation

At the end of your phase I training and before entering phase II, you will take an on-line, multiple choice examination. It will test your comprehension of the learning objectives from this and other lessons in phase I. You must correctly answer 70 percent or more of the questions on the examination to receive a GO. Failure to achieve a GO on the examination will result in a retest. Failure on the retest could result in your dismissal from the course.

Instructional Lead-In

A soldier's level of physical fitness has a direct impact on his combat readiness. In other words, if he's not physically and mentally fit, he's not supporting the Army's physical fitness objectives.

SECTION III. PRESENTATION

A. ENABLING LEARNING OBJECTIVE

ACTION:	Identify the Army's policy governing physical fitness programs.
CONDITIONS:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1).
STANDARDS:	Identified the Army's policy governing physical fitness programs IAW AR 350-1 (SH-1).

1. Learning Step / Activity 1. Identify the Army's Policy Governing Physical Fitness Programs

Method of Instruction: Study Assignment
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 20 mins
Media: None

To complete this learning step activity, you are to--

- Read the above ELO.
- Read AR 350-1 (SH-1), pp SH-1-1 thru SH-1-7.

2. Learning Step / Activity 2. Identify the Army's Policy Governing Physical Fitness Programs

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 10 minutes to complete the questions.
- Complete questions 1 thru 8 of Practical Exercise 1, p C-2.
- Compare your responses with the solutions on pp C-6 and C-7 for Practical Exercise 1.
- If your response does not agree, review the appropriate reference/lesson material.

CHECK ON LEARNING: Practical Exercise 1 serves as the check on learning for this ELO.

B. ENABLING LEARNING OBJECTIVE

ACTION:	Identify the general physical fitness provisions.
CONDITIONS:	As a first sergeant in a self-study environment given extracted material from FM 21-20 (SH-2).
STANDARDS:	Identified the general physical fitness provisions IAW FM 21-20 (SH-2).

1. Learning Step / Activity 1. Identify the General Physical Fitness Provisions

Method of Instruction: Study Assignment
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 20 mins
Media: None

To complete this learning step activity, you are to--

- Read the above ELO.
- Read FM 21-20 (SH-2), pp SH-2-3 thru SH-2-15.

2. Learning Step / Activity 2. Identify the General Physical Fitness Provisions

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 10 minutes to complete the questions.
- Complete questions 9 thru 18 of Practical Exercise 1, p C-3.
- Compare your responses with the solutions on pp C-7 and C-8 for Practical Exercise 1.
- If your response does not agree, review the appropriate reference/lesson material.

CHECK ON LEARNING: Practical Exercise 1 serves as the check on learning for this ELO.

C. ENABLING LEARNING OBJECTIVE

ACTION:	Determine cardiorespiratory fitness.
CONDITIONS:	As a first sergeant in a classroom environment, given FM 21-20.
STANDARDS:	Described cardiorespiratory fitness IAW FM 21-20.

1. Learning Step / Activity 1. Determine Cardiorespiratory Fitness

Method of Instruction: Study Assignment
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 20 mins
Media: None

To complete this learning step activity, you are to--

- Read the above ELO.
- Read FM 21-20 (SH-2), pp SH-2-16 thru SH-2-21.

2. Learning Step / Activity 2. Determine Cardiorespiratory Fitness

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 10 minutes to complete the questions.
- Complete questions 19 thru 23 of Practical Exercise 1, p C-4.
- Compare your responses with the solutions on p C-8 for Practical Exercise 1.
- If your response does not agree, review the appropriate reference/lesson material.

CHECK ON LEARNING: The practical exercise serves as a check on learning.

D. ENABLING LEARNING OBJECTIVE

ACTION:	Interpret muscular endurance and strength.
CONDITIONS:	As a first sergeant in a self-study environment given extracted material from FM 21-20 (SH-2).
STANDARDS:	Interpreted muscular endurance and strength IAW FM 21-20 (SH-2).

1. Learning Step / Activity 1. Interpret Muscular Endurance and Strength

Method of Instruction: Study Assignment
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 15 mins
Media: None

To complete this learning step activity, you are to--

- Read the above ELO.
- Read FM 21-20 (SH-2), pp SH-2-22 thru SH-2-26.

2. Learning Step / Activity 2. Interpret Muscular Endurance and Strength

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 10 minutes to complete the questions.
- Complete questions 24 thru 35 of Practical Exercise 1, pp C-4 and C-5.
- Compare your responses with the solutions on pp C-9 and C-10 for Practical Exercise 1.
- If your response does not agree, review the appropriate reference/lesson material.

CHECK ON LEARNING: Practical Exercise 1 serves as the check on learning for this ELO.

E. ENABLING LEARNING OBJECTIVE

ACTION:	Interpret flexibility.
CONDITIONS:	As a first sergeant in a self-study environment given extracted material from FM 21-20 (SH-2).
STANDARDS:	Interpreted flexibility IAW FM 21-20 (SH-2).

1. Learning Step / Activity 1. Interpret Flexibility

Method of Instruction: Study Assignment
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 15 mins
Media: None

To complete this learning step activity, you are to--

- Read the above ELO.
- Read FM 21-20 (SH-2), pp SH-2-27 thru SH-2-29.

2. Learning Step / Activity 2. Interpret Flexibility

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 10 minutes to complete the questions.
- Complete questions 36 and 37 of Practical Exercise 1, p C-5.
- Compare your responses with the solutions on p C-10 for Practical Exercise 1.
- If your response does not agree, review the appropriate reference/lesson material.

CHECK ON LEARNING: Practical Exercise 1 serves as the check on learning for this ELO.

F. ENABLING LEARNING OBJECTIVE

ACTION:	Determine body composition.
CONDITIONS:	As a first sergeant in a classroom environment, given FM 21-20.
STANDARDS:	Described body composition IAW FM 21-20.

1. Learning Step / Activity 1. Determine Body Composition

Method of Instruction: Study Assignment
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

To complete this learning step activity, you are to--

- Read the above ELO.
- Read FM 21-20 (SH-2), pp SH-2-30 and SH-2-31.

2. Learning Step / Activity 2. Determine Body Composition

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 10 mins
Media: None

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 10 minutes to complete the questions.
- Complete questions 38 and 39 of Practical Exercise 1, p C-5.
- Compare your responses with the solutions on p C-10 for Practical Exercise 1.
- If your response does not agree, review the appropriate reference/lesson material.

G. ENABLING LEARNING OBJECTIVE

ACTION:	Develop a unit physical fitness program.
CONDITIONS:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).
STANDARDS:	Developed a unit physical fitness program IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).

1. Learning Step / Activity 1. Develop a Unit Physical Fitness Program

Method of Instruction: Practical Exercise (Performance)
Technique of Delivery: Individualized, self-paced Instruction
Instructor to Student Ratio: 1:14
Time of Instruction: 30 mins
Media: None

- Read the above ELO.
- Study FM 21-20 (SH-2), pp SH-2-32 thru SH-2-43.
- The Army's goal is to ensure that each soldier's physical ability is adequate so he can survive and win on the battlefield. You, as leaders, must understand all aspects of physical performance. However, you must be aware of the risks involved with physical training. You should plan wisely to minimize injuries and accidents. A first sergeant must be able to apply the principles of exercise and the **FITT** factors in order to develop a sound physical fitness program that will enable his soldiers to accomplish the overall mission.
- There are seven steps in planning and developing your unit's fitness program. FM 21-20 (SH-2) describes and illustrates the necessary steps necessary to develop a strong fitness program. Utilize the illustrations and develop a four-week physical fitness program for your unit.
- Complete PE-2 (Appendix C).
- Complete PE-2 and bring it with you to Phase II, resident portion of the First Sergeants Course. During Phase II, you will present your practical exercise and discuss it with other students.
- Your instructor will provide feedback on how to improve your unit's physical fitness program.

CHECK ON LEARNING: Practical Exercise 2 serves as the check on learning for this ELO.

SECTION IV. SUMMARY

Method of Instruction: <u>Study Assignment</u>
Technique of Delivery: <u>Individualized, self-paced Instruction</u>
Instructor to Student Ratio is: <u>1:14</u>
Time of Instruction: <u>5 mins</u>
Media: <u>None</u>

Check on Learning

The practical exercises in Appendix C serve as the check on learning this lesson.

Review / Summarize Lesson

Commanders, first sergeants, and supervisors are responsible for ensuring all soldiers in their units maintain the highest level of physical fitness. All leaders must plan, conduct, evaluate, and test physical training within their units. The benefits to be derived from a good physical fitness program are many. It can reduce the number of soldiers on profile and sick call, invigorate training, and enhance productivity and mental alertness. As leaders, your physical fitness should be a source of confidence and inspiration to your soldiers.

SECTION V. STUDENT EVALUATION

Testing Requirements

At the end of your phase I training and before entering phase II, you will take an on-line, multiple choice examination. It will test your comprehension of the learning objectives from this and other lessons in phase I. You must correctly answer 70 percent or more of the questions on the examination to receive a GO. Failure to achieve a GO on the examination will result in a retest. Failure on the retest could result in your dismissal from the course.

Feedback Requirements

NOTE: Feedback is essential to effective learning. Please complete the student questionnaire and mail to USASMA.

Directions

Complete the following blocks:

- Enter your name, your rank, and the date you complete this questionnaire.

Name:

Rank:

Date:

- Answer items 1 through 6 below in the space provided.
- Fold the questionnaire so the address for USASMA is visible.
- Print your return address, add postage, and mail.

NOTE: Your response to this questionnaire will assist the Academy in refining and improving the course. When completing the questionnaire, answer each question frankly. Your assistance helps build and maintain the best Academy curriculum possible.

Item 1

Do you feel you have met the learning objectives of this lesson?

Item 2

Was the material covered in this lesson new to you?

Item 3

Which parts of this lesson were most helpful to you in the learning objectives?

Item 4

How could we improve the format of this lesson?

Item 5

How could we improve the content of this lesson?

Item 6

Do you have additional questions or comments? If you do, please list them here. You may add additional pages if necessary

ATTN ATSS CDD FSC TATS
COMDT USASMA
BLDG 11291 BIGGS FLD
FT BLISS TX 79918-8002

Appendix A - Viewgraph Masters (N/A)

Appendix B - Test(s) and Test Solution(s) (N/A)

Appendix C

PRACTICAL EXERCISE 1

Title	IMPLEMENT UNIT AND INDIVIDUAL FITNESS TRAINING PROGRAMS						
Lesson Number / Title	P661 I version 1 / MONITOR UNIT AND INDIVIDUAL FITNESS TRAINING PROGRAMS						
Introduction	None						
Motivator	None						
Terminal Learning Objective	<p>At the completion of this lesson, you [the student] will:</p> <table><tr><td>Action:</td><td>Implement unit and individual fitness training programs.</td></tr><tr><td>Conditions:</td><td>As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).</td></tr><tr><td>Standards:</td><td>Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).</td></tr></table>	Action:	Implement unit and individual fitness training programs.	Conditions:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).	Standards:	Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).
Action:	Implement unit and individual fitness training programs.						
Conditions:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).						
Standards:	Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).						
Safety Requirements	None						
Risk Assessment	Low						
Environmental Considerations	None						
Evaluation	Check your responses to the situations with the solutions on pp C-X and C-X. If your responses do not match the responses in the solution, you should study the appropriate references as indicated.						
Instructional Lead-In	A soldier's level of physical fitness has a direct impact on his combat readiness. In other words, if he's not physically and mentally fit, he's not supporting the Army's physical fitness objectives.						
Resource Requirements	<p>Instructor Materials: None</p> <p>Student Materials:</p> <ul style="list-style-type: none">• Pen or pencil and writing paper.						
Special Instructions	Write your answer in the space provided for each question. Do not use any reference material or refer to the solutions while you complete the questions in this practical exercise.						

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Procedures

Do not use any reference material or refer to the solution when you complete the questions in this practical exercise. Write your answer in the space provided.

- This is a self-graded exercise.
- It should take you approximately 1 hour to complete the questions and 10 minutes to self-grade this PE using AR 350-1 (SH-1) and FM 21-20 (SH-2).

QUESTION 1: What is the objective of the Army physical fitness program?

QUESTION 2: What criteria do you use to measure the Army's physical fitness program objective?

QUESTION 3: To whom does the Army's physical fitness policy apply?

QUESTION 4: Who is responsible for establishing and conducting physical fitness programs consistent with AR 350-1, FM 21-20, and unit missions?

QUESTION 5: Can the commander set APFT standards that exceed the minimum standards?

QUESTION 6: Under what condition may the commander set a higher standard?

QUESTION 7: How should units design special programs appropriate for soldiers who have difficulty meeting unit or Army standards?

QUESTION 8: What can competitive, intramural sports programs do for your unit's physical fitness program?

**Procedures,
continued**

QUESTION 9: What are some of the leadership responsibilities concerning physical fitness?

QUESTION 10: What are the five components of fitness?

QUESTION 11: What are the seven principles of exercise?

QUESTION 12: What does the acronym F I T T mean?

QUESTION 13: Why is it important to conduct warm-up exercises before PT and cool-down exercises after PT?

QUESTION 14: What should warm-up and cool-down activities include?

QUESTION 15: What are the three phases of fitness conditioning?

QUESTION 16: What are the types of fitness programs?

QUESTION 17: Should age be a factor in physical fitness?

QUESTION 18: What are the two APFT categories of testing for all military personnel?

**Procedures,
continued**

QUESTION 19: What exactly is cardiorespiratory fitness/endurance?

QUESTION 20: How does frequency apply to aerobic training?

QUESTION 21: What does intensity represent during aerobic training?

QUESTION 22: What do we mean by time in relation to aerobic training?

QUESTION 23: What do we mean by type in relation to aerobic training?

QUESTION 24: What is muscular strength?

QUESTION 25: What is muscular endurance?

QUESTION 26: What is an isometric contraction?

QUESTION 27: What is an isotonic contraction?

QUESTION 28: What is an isokinetic contraction?

QUESTION 29: What do we mean by overload with respect to exercising?

**Procedures,
continued**

QUESTION 30: What do we mean by the principle progression?

QUESTION 31: What is specificity?

QUESTION 32: What do we mean by regularity?

QUESTION 33: What do we mean by recovery?

QUESTION 34: What is balance?

QUESTION 35: What do we mean by variety?

QUESTION 36: What is the purpose of each of the four categories of stretching techniques?

QUESTION 37: What is the purpose of the warm-up exercise?

QUESTION 38: What factors influence the body composition?

QUESTION 39: What type of exercise is best for burning fat?

**Feedback
Requirements**

None

SOLUTION TO PRACTICAL EXERCISE PE 1

QUESTION 1: What is the objective of the Army physical fitness program?

ANSWER: The objective is to enhance combat readiness by developing and sustaining a high level of physical fitness in soldiers.

Ref: AR 350-1 (SH-1), p SH-1-2, para 1-21a

QUESTION 2: What are the ten criteria used to measure the Army's physical fitness program objective?

ANSWER:

- (1) Cardiorespiratory endurance.
- (2) Muscular strength and endurance.
- (3) Flexibility.
- (4) Body composition standards as prescribed by AR 600-9.
- (5) Motor efficiency (coordination, agility, balance, posture, speed, power, and kinesthetic awareness).
- (6) Anaerobic conditioning.
- (7) Competitive spirit, the will to win, and unit cohesion.
- (8) Self-discipline.
- (9) A healthy lifestyle that includes good nutrition, excludes smoking, and avoids misuse of alcohol and drugs.
- (10) The ability to cope with all types of stress.

Ref: AR 350-1 (SH-1), p SH-1-2, para 1-21a(1) thru (10)

QUESTION 3: To whom does the Army's physical fitness policy apply?

ANSWER: It applies to all soldiers, functional branches, units, and operating agencies Army-wide.

Ref: AR 350-1 (SH-1), p SH-1-2, para 1-21b

QUESTION 4: Who is responsible for establishing and conducting physical fitness programs consistent with AR 350-1, FM 21-20, and unit missions?

ANSWER: Commanders and supervisors.

Ref: AR 350-1 (SH-1), p SH-1-2, para 1-21b(1)

QUESTION 5: Can the commander set APFT standards that exceed the minimum standards?

Answer: Yes; however, individuals must be aware of these goals and be able to achieve them safely through the use of normal training time and adherence to the principles of conditioning outlined in FM 21-20.

Ref: AR 350-1 (SH-1), p SH-1-5, para 4-9a(2)

QUESTION 6: Under what condition may the commander set a higher unit APFT goal?

ANSWER: Commanders who establish higher goals should do so because their unit missions require soldiers to be more than minimally fit.

Ref: AR 350-1 (SH-1), p SH-1-5, para 4-9a(2)

QUESTION 7: What should you keep in mind when designing a special conditioning program for soldiers who have difficulty meeting unit or Army standards?

ANSWER: Design programs that are not punitive, improve the fitness level of soldiers, and meet individual needs to overcome identified weaknesses (for example, aerobic or strength deficiency). In addition, they should encourage a healthy lifestyle.

Ref: AR 350-1 (SH-1), p SH-1-5, para 4-9a(4)

QUESTION 8: What can competitive, intramural sports programs do for your unit's physical fitness program?

ANSWER: They can build esprit de corps, teamwork, and morale.

Ref: AR 350-1 (SH-1), p SH-1-5, para 4-9a(6)

QUESTION 9: What are some of the leadership responsibilities concerning physical fitness?

ANSWER:

- Leaders must understand and practice new Army doctrine of physical fitness.
- Leaders must be visible and active participants in physical training programs.
- Leaders must emphasize the value of physical training and clearly explain the objectives and benefits of the program.
- Leaders should continually assess their units.
- Leaders should not punish soldiers who fail to perform to standard.
- Leaders must plan special training to help soldiers who need it.

Ref: FM 21-20 (SH-2), p SH-2-3, right column

QUESTION 10: What are the components of physical fitness?

ANSWER:

- Cardiorespiratory (CR) endurance.
- Muscular strength.
- Muscular endurance.
- Flexibility.
- Body composition.

Ref: FM 21-20 (SH-2), p SH-2-5, left column

QUESTION 11: What are the principles of exercise?

ANSWER:

- Regularity.
- Progression.
- Balance.
- Variety.
- Specificity.
- Recovery.
- Overload.

Ref: FM 21-20 (SH-2), p SH-2-5, right column

QUESTION 12: What does the acronym F I T T mean?

ANSWER:

- Frequency.
- Intensity.
- Time.
- Type.

Ref: FM 21-20 (SH-2), pp SH-2-6 and SH-2-7

QUESTION 13: Why is it important to conduct warm-up exercises before PT and cool-down exercises after PT?

ANSWER: Warm-ups may help prevent injuries and maximize performance. Cool-downs gradually slow the heart rate and help prevent pooling of the blood in the legs and feet.

Ref: FM 21-20 (SH-2), p SH-2-9, left column

QUESTION 14: What should warm-up and cool-down activities include?

ANSWER:

- Warm-Up: Running-in-place or slow jogging, stretching, and calisthenics.
- Cool-Down: Walk and stretch until heart rate returns to less than 100 beats per minute (BPM) and heavy sweating stops.

Ref: FM 21-20 (SH-2), p SH-2-9, left column

QUESTION 15: What are the three phases of fitness conditioning?

ANSWER: Preparatory phase, Conditioning phase, and Maintenance phase.

Ref: FM 21-20 (SH-2), pp 2-9 and SH-2-10

QUESTION 16: What are the types of fitness programs?

ANSWER: Unit, individual, and special programs.

Ref: FM 21-20 (SH-2), p SH-2-10, right column

QUESTION 17: Should age be a factor in physical fitness?

ANSWER: Yes, because people undergo many changes as they get older.

Ref: FM 21-20 (SH-2), p SH-2-14, left column

QUESTION 18: What are the two APFT categories of testing for all military personnel?

ANSWER: Initial entry training (IET) and the Army standard.

Ref: FM 21-20 (SH-2), p SH-2-15, left column

QUESTION 19: What is cardiorespiratory fitness/endurance?

ANSWER: CR fitness is a condition in which the body's cardiovascular (circulatory) and respiratory systems function together, especially during exercise or work, to ensure that adequate oxygen is supplied to the working muscles to produce energy.

Ref: FM 21-20 (SH-2), p SH-2-16, left column

QUESTION 20: How does frequency apply to aerobic training?

ANSWER: Frequency refers to how often a person exercises. It relates to the intensity and duration of the exercise session.

Ref: FM 21-20 (SH-2), p SH-2-17, right column

QUESTION 21: What does intensity represent during aerobic training?

ANSWER: It represents the degree of effort with which one trains and is probably the single most important factor for improving performance.

Ref: FM 21-20 (SH-2), p SH-2-17, right column

QUESTION 22: What do we mean by time in relation to aerobic training?

ANSWER: Time, or duration, refers to how long one exercises.

Ref: FM 21-20 (SH-2), p SH-2-20, left column

QUESTION 23: What do we mean by type in relation to aerobic training and what are some primary exercise examples?

ANSWER: Type, refers to the kinds of aerobic exercises that require breathing in large volumes of air to improve cardiorespiratory (CR) fitness. Some examples are running, bicycling, and stair climbing.

Ref: FM 21-20 (SH-2), pp 2-20 and SH-2-21

QUESTION 24: What is muscular strength?

ANSWER: Muscular strength is the greatest amount of force a muscle or muscle group can exert in a single effort.

Ref: FM 21-20 (SH-2), p SH-2-22, left column

QUESTION 25: What is muscular endurance?

ANSWER: Muscle endurance is the ability of a muscle or muscle group to do repeated contractions against a less-than-maximum resistance for a given time.

Ref: FM 21-20 (SH-2), p SH-2-22, left column

QUESTION 26: What is an isometric contraction?

ANSWER: Isometric contraction produces contraction but no movement, as in pushing against a wall.

Ref: FM 21-20 (SH-2), p SH-2-22, left column

QUESTION 27: What is isotonic contraction?

ANSWER: Isotonic contraction causes a joint to move through a range of motion against a constant resistance.

Ref: FM 21-20 (SH-2), p SH-2-22, bottom left column and upper right column

QUESTION 28: What is isokinetic contraction?

ANSWER: Isokinetic contraction causes the angle at the joint to change at a constant rate.

Ref: FM 21-20 (SH-2), p SH-2-22, right column

QUESTION 29: What is overload with respect to exercising?

ANSWER: The overload principle is the basis for all exercise training programs. For a muscle to increase in strength, we must increase its workload beyond what it normally experiences.

Ref: FM 21-20 (SH-2), p SH-2-23, left column

QUESTION 30: What do we mean by the principle progression?

ANSWER: When a muscle receives an overload, it adapts by becoming stronger and/or improving its endurance.

Ref: FM 21-20 (SH-2), p SH-2-24, right column

QUESTION 31: What is specificity?

ANSWER: Provides resistance to the specific muscle groups that need strengthening.

Ref: FM 21-20 (SH-2), p SH-2-25, left column

QUESTION 32: What do we mean by regularity?

ANSWER: Regular exercise that produces a training effect. Sporadic exercise may do more harm than good.

Ref: FM 21-20 (SH-2), p SH-2-25, left column

QUESTION 33: What do we mean by recovery?

ANSWER: Consecutive days of hard resistance training for the same muscle group can be detrimental. The muscles must have sufficient recovery time to adapt. There should be at least a 48-hour recovery period between workouts for the same muscle group.

Ref: FM 21-20 (SH-2), p SH-2-25, right column

QUESTION 34: What is balance?

ANSWER: Inclusion of exercises that work all the major muscle groups in both the upper and lower body.

Ref: FM 21-20 (SH-2), p SH-2-25, right column

QUESTION 35: What do we mean by variety?

ANSWER: Use different equipment, change the exercises, and alter the volume and intensity of the exercise.

Ref: FM 21-20 (SH-2), p SH-2-26, right column

QUESTION 36: What is the purpose of each of the four categories of stretching techniques?

ANSWER:

- Static: gradually lengthens muscles and tendons as a body part moves around a joint.
- Passive: involves use of a partner or equipment.
- PNF: uses neuromuscular patterns of each muscle to improve flexibility.
- Ballistic: involves movements of bouncing and bobbing to attain a greater range of motion and stretch.

Ref: FM 21-20 (SH-2), p SH-2-27, right column

QUESTION 37: What is the purpose of the warm-up exercise?

ANSWER: Warm-up exercises increase the flow of blood to the muscles and tendons, thus helping reduce the risk of injury.

Ref: FM 21-20 (SH-2), p SH-2-28, left column

QUESTION 38: What factors influence body composition?

ANSWER: Age, diet, fitness level, and genetic factors (gender and body type).

Ref: FM 21-20 (SH-2), p SH-2-30, left column

QUESTION 39: What type of exercise is best for burning fat?

ANSWER: Aerobic exercise is the best type of activity for burning fat.

Ref: FM 21-20 (SH-2), p SH-2-31

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PRACTICAL EXERCISE 2

Title	DEVELOP A UNIT PHYSICAL FITNESS PROGRAM						
Lesson Number / Title	P661 I version 1 / MONITOR UNIT AND INDIVIDUAL FITNESS TRAINING PROGRAMS						
Introduction	None						
Motivator	As a First Sergeant, one of your requirements is to establish, monitor, and conduct a physical fitness program that is consistent with AR 350-1, FM 21-20, and your unit's mission. The program should include sufficient intensity, duration, and frequency to maintain adequate cardiorespiratory endurance, muscular strength and endurance, flexibility, and body composition. A good physical fitness program enables your soldiers to accomplish their mission and help increase their APFT scores.						
Terminal Learning Objective	<p>At the completion of this lesson, you [the student] will:</p> <table><tr><td>Action:</td><td>Implement unit and individual fitness training programs.</td></tr><tr><td>Conditions:</td><td>As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).</td></tr><tr><td>Standards:</td><td>Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).</td></tr></table>	Action:	Implement unit and individual fitness training programs.	Conditions:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).	Standards:	Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).
Action:	Implement unit and individual fitness training programs.						
Conditions:	As a first sergeant in a self-study environment given extracted material from AR 350-1 (SH-1) and FM 21-20 (SH-2).						
Standards:	Implemented unit and individual fitness training programs IAW AR 350-1 (SH-1) and FM 21-20 (SH-2).						
Safety Requirements	None						
Risk Assessment	Low						
Environmental Considerations	None						
Evaluation	Your instructor will review your unit-training plan for content and completeness based upon the requirements.						
Instructional Lead-In	None						
Resource Requirements	<p>Instructor Materials: None</p> <p>Student Materials:</p> <ul style="list-style-type: none">• P661.• Pen or pencil and writing paper.						

**Special
Instructions**

Study FM 21-20 (SH-2), pp 2-32 thru 2-43. This chapter explains and illustrates the development of a unit's physical fitness training plan. Use figures 10-1 thru 10-4 to help you set up a four-week physical fitness training plan. Complete PE-2 and bring it with you during the resident phase (Phase II). Your instructor will review your PE and provide you with feedback on how to improve your fitness program. There is no concrete answer because of unit's mission and Mission Essential Task List (METL) drive the physical fitness program selected for your unit.

Procedures

Use the sample training program in Student Handout 2, figures 10-1 thru 10-4 to help you design a four-week (or month for RC) unit physical fitness training program that supports your current unit mission and includes the following:

- a. Your unit mission (SH-2, p SH-2-32).
 - b. A unit goal statement (SH-2, p SH-2-32).
 - c. The method used to assess the unit's overall fitness (SH-2, p SH-2-32).
 - d. The **FITT** factors (SH-2, pp SH-2-6 thru SH-2-8).
 - e. The principles of exercise (SH-2, p SH-2-5).
 - f. The phases of fitness (SH-2, pp 2-9 and SH-2-10).
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Appendix D

HANDOUTS FOR LESSON 1: P661 I version 1

This appendix contains the items listed in this table--

Title/Synopsis	Pages
SH-1, Extracted Material from AR 350-1, Army Training and Education	SH-1-1 thru SH-1-7
SH-2, Extracted Material from FM 21-20, Physical Fitness Training	SH-2-1 thru SH-2-43

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Student Handout 1

This student handout contains 6 pages of material from the following publication:

AR 350-1, Army Training and Education, 9 April 2003

<u>Paragraph</u>	<u>Title</u>	<u>Page</u>
1-21,	Army Physical Fitness Training Program	SH-1-2
4-9,	Army physical fitness training in units	SH-1-5

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1–21. Army Physical Fitness Training Program

a. The objective of the Army Physical Fitness Training Program is to enhance combat readiness by developing and sustaining a high level of physical fitness in soldiers as measured by:

- (1) Cardiorespiratory endurance.
- (2) Muscular strength and endurance.
- (3) Flexibility.
- (4) Body composition standards as prescribed by AR 600–9.
- (5) Motor efficiency (coordination, agility, balance, posture, speed, power, and kinesthetic awareness).
- (6) Anaerobic conditioning.
- (7) Competitive spirit, the will to win, and unit cohesion.
- (8) Self-discipline.
- (9) A healthy lifestyle that includes good nutrition, excludes smoking, and avoids misuse of alcohol and drugs.
- (10) The ability to cope with all types of stress.

b. The physical fitness policy applies Army-wide. It includes all soldiers, functional branches, units, and operating agencies. Physical fitness provides a foundation for combat readiness and must be an integral part of every soldier's life. Unit readiness begins with the physical fitness of soldiers and the NCOs and officers who lead them.

- (1) Commanders and supervisors will establish physical fitness programs consistent with this regulation, FM 21–20, and unit missions. Exercise periods will be conducted with sufficient intensity, frequency, and duration to maintain adequate cardiorespiratory endurance, muscular strength and endurance, flexibility, and body composition.
- (2) Soldiers must meet the physical fitness standards set forth in FM 21–20 and this regulation. Soldiers who are unable to meet these standards or the mission-related physical fitness standards required of their duty assignment may be subject to administrative action.

c. Personnel in the active Army, ARNG, and USAR will take part in either collective or individual physical fitness training programs year-round. Active Army units, individuals, and RC soldiers on active duty will conduct regularly scheduled (at least three to five times per week), vigorous physical fitness training during the unit's normal duty day as determined by the commander.

- (1) Commanders of ARNG and USAR units incorporate mission and battle-focused physical fitness training into appropriate inactive duty training periods.
- (2) Personnel will be excused from physical fitness training only during periods of temporary or permanent medical limitations established in accordance with AR 40–501.
- (3) Personnel who cannot take part in physical fitness training because of a profile condition will be placed in rehabilitative programs and, within profile guidelines given by health care personnel, be supervised by the commander.
- (4) Soldiers age 40 and over will be evaluated for coronary heart disease risk factors as part of their periodic physical examination. The medical procedures for the cardiovascular screening program (CVSP) are outlined in AR 40–501. It is the soldier's responsibility to ensure that the CVSP is conducted as close to the 40th birthday as possible and as promptly as medical facilities permit.
- (5) All soldiers centrally selected for command positions and Command Sergeants Major (CSM) designees, regardless of age, must have a CVSP, meet body composition standards set forth in AR 600–9, and pass the Army Physical Fitness Test (APFT) or an alternate before assuming command or assignment to a CSM position. A CVSP clearance granted during the soldier's last periodic physical examination is sufficient to meet the CVSP requirement.

d. Physical fitness standards are developed by TRADOC and approved by HQDA, DCS, G–3. The APFT provides a measure of cardiorespiratory and upper and lower body muscular endurance. It is a performance test that indicates a soldier's ability to perform physically and handle his or her own body weight. Standards are adjusted for age and physiological differences between men and women. The APFT consists of push-ups, sit-ups, and a 2-mile run, done in that order on the same day. (See repetition and time guidelines in FM 21–20.) For soldiers on a permanent profile, a record test must include an aerobic event. The only approved aerobic events are the 2-mile run, 800-yard swim, 6.2-mile bike ride (stationary or track), or the 2.5-mile walk. Testing is prescribed for all soldiers as follows:

- (1) The APFT provides an assessment of the physical fitness training program. Physical conditioning or training periods solely devoted toward meeting APFT requirements are discouraged.
- (2) Commanders may administer the APFT as often as they wish; however, they must specify beforehand when the results are for record. The Active Army, Active Guard/Reserve (AGR), and USAR Troop Program Unit (TPU) soldiers will take the APFT at least twice each calendar year. A minimum of 4 months will separate record tests if only two record tests are given. The intent is for the Active Army, the AGR, and USAR TPU soldiers to take a record APFT every 6 months. Mission requirements often prevent the even spacing of record tests. Therefore, commanders are encouraged to test soldiers for record as close to the record test window as possible.
- (3) Soldiers in the ARNG TPUs will take the APFT at least once each calendar year. A minimum of 8 months will separate record tests if only one test is given. Soldiers that require makeup testing or re-testing for an APFT failure are exempt from the 8-months rule. Soldiers requiring makeup testing will be scheduled in accordance with the unit Standard Operating Procedures (SOP). Soldiers requiring retesting for an APFT failure will be scheduled as prescribed in para 1-21d(5) of this regulation.
- (4) Personnel with permanent medical profiles that preclude participation in the pushup or situp event will take the remaining events if a physician or physician's assistant approves. The 2-mile run event, or an approved alternate test event as outlined in FM 21-20, must be taken if the test is for record. The alternate test is for soldiers with permanent physical profiles that prevent them from running 2 miles. Soldiers with temporary profiles of long duration (more than 3 months) may also take an alternate test if approved by the commander and health care personnel. Soldiers must be given 3 months to prepare for the alternate test from either the date of the profile or the date recommended by health care personnel.
- (5) Soldiers who fail a record APFT for the first time or fail to take a record APFT within the required period will be flagged in accordance with AR 600-8-2. In the event of a record test failure, commanders may allow soldiers to retake the test as soon as the soldier and the commander feel the soldier is ready. Soldiers without a medical profile will be retested no later than 90 days following the initial APFT failure. Reserve component soldiers' not on active duty and without a medical profile will be tested no later than 180 days following the initial APFT failure.
- (6) Personnel who initially fail the CVSP and are subsequently cleared will have no more than 179 days of conditioning before retaking a record APFT.
- (7) All soldiers must attain a score of at least 60 points on each test event or receive a "GO" on the alternate aerobic events. If a soldier does not attain a minimum of 60 points in each event or a "GO" on an alternate aerobic event, the soldier is an event failure. When a soldier fails one or more events, the soldier is a test failure. Exceptions are listed below:
 - (a) Soldiers in basic training must attain 50 points on each event or a score as determined by HQDA, DCS, G-3, in coordination with TRADOC. (This exception does not apply to advanced individual training (AIT), one station unit training (OSUT), or leader development schools.)
 - (b) Soldiers awaiting IET may be tested, but no formal record of their score will be maintained.
- (8) Soldiers in IET will be tested near the end of the course to qualify for completion of basic training, AIT, and OSUT.
- (9) Soldiers in joint, North Atlantic Treaty Organization (NATO), Office of the Secretary of Defense, and other staff assignments will take the APFT. The senior Army soldier in the organization will ensure the APFT is conducted and scores are included in records and performance reports.
- (10) Individual Mobilization Augmentee (IMA) and Individual Ready Reserve (IRR) soldiers who are on tours of AT, active duty training, or active duty special work will take the APFT when they are placed on tours of duty for 12 or more consecutive calendar days. No APFT will be administered during those years in which an IMA and IRR soldier does not serve an active duty tour. Those who fail the test will be retested in accordance with the provisions of para 1-21d(5). Reserve Component soldiers assigned or attached to active Army units and organizations for 30 consecutive days or more will follow the physical fitness program for that unit or organization.
- (11) The TRADOC recommends physical fitness standards for entry into Ranger and Airborne training and into other schools having separate physical fitness standards. The U.S. Army Special Operations Command (USASOC), in conjunction with TRADOC, sets the fitness standards for entry into Special Forces training. The HQDA, ODCS, G-3, reviews and approves these standards.

- e.* Field Manual 21–20 provides guidance for preventing injuries during physical training.
 - (1) Trainers will be alert to symptoms indicating that a soldier’s endurance limits have been reached or exceeded, or a serious medical condition exists.
 - (2) If a trainer detects any symptoms, exercises will be stopped, and the soldier immediately referred for medical evaluation.
 - (3) Training intensity should be increased slowly so that the body can adapt to more strenuous training.
 - (4) Environmental considerations, particularly weather and altitude, are important in planning physical training programs.
 - (5) If a soldier fails to meet the physical fitness standards in FM 21–20, the unit commander will remove the soldier from parachute, diving, or flight crew status. This action will be taken to ensure the safety of that soldier and other unit members.
- f.* Policy governing military physical fitness standards during institutional training is contained in chapter 3. Guidance concerning physical fitness training in units is provided in chapter 4.

4–9. Army physical fitness training in units

Policy governing the Army Physical Fitness Training Program is in chapter 1 of this regulation. Chapter 3 provides guidance for physical fitness standards during institutional training. This paragraph provides policy concerning physical fitness standards for units.

a. Commanders will conduct physical fitness training programs that enhance soldiers' abilities to complete soldier or leader tasks that support the unit's METL.

(1) Preparation for the APFT is of secondary importance. Maintenance of the military skills listed below will also be emphasized.

- (a) Agility, to include fast movement in enclosed spaces (sprinting and lateral movement).
- (b) Balance and controlling fear of heights.
- (c) Vaulting, jumping, and landing correctly.
- (d) Forced marching with loads, to include cross-country movement.
- (e) Strength development activities such as rope climbing, pull ups, and resistance exercises.
- (f) Crawling.
- (g) Negotiation of natural and man-made obstacles (confidence and obstacle courses).

(2) Commanders may establish unit APFT mission related goals which exceed Army minimum standards.

However, individuals must be aware of these goals and be able to achieve them safely through the use of normal training time and adherence to the principles of conditioning outlined in FM 21–20. Personnel who meet Army minimum standards, but fail to meet unit goals, may not be punished or disciplined. However, they may be required to participate in special conditioning programs which focus on overcoming a weakness. Commanders who establish higher goals should do so because their unit missions require soldiers to be more than minimally fit. Like-units with identical missions (companies within battalions, battalions within brigades) should have similar standards. Care must be taken by the chain of command to ensure unit goals do not arbitrarily replace Army standards.

(3) Physical performance requirements are inherent in many tasks listed in the soldier's manual for each MOS. The ability to perform MOS physical tasks is one of the criteria for graduation from IET. Soldiers in units must maintain physical fitness proficiency as part of their overall MOS proficiency.

(4) Special conditioning programs are appropriate for soldiers who have difficulty meeting unit goals or Army standards. Such programs will not be punitive; they must be designed to improve the fitness level of soldiers. Additional training sessions are not always a substitute for smart, tailored conditioning sessions and can lead to over training. Special conditioning programs will be designed to meet individual needs to overcome identified weaknesses (for example, aerobic or strength deficiency). In addition, they should encourage a healthy lifestyle.

(5) Special physical fitness programs will be tailored according to FM 21–20 and kept separate and distinct from the Army Body Composition and Weight Control Program, except for the exercise programs prescribed to assist soldiers with weight control problems. Commanders should avoid placing all soldiers that exceed body composition standards or have fitness problems in the same category with the expectation that more exercise will automatically result in decreased body composition and weight. Special programs will be employed for soldiers with physical fitness problems. Separate special programs or additional physical training is not always a solution to overcome identified weaknesses. Commanders are encouraged to place soldiers with special fitness needs into the regular unit fitness program whenever possible. These programs will not be used to discipline soldiers who may have attitude problems toward physical exercise. Master fitness trainers will be tasked by the commander to develop special programs and monitor soldiers with special fitness requirements.

(6) Competitive, intramural sports programs should complement unit physical fitness programs and be used to build esprit de corps, teamwork, and morale. Unit sports activities, however, must be sufficiently rigorous to develop some of the physical fitness components outlined in paragraph 1–21a. of this regulation. They should not substitute for a formal program of physical conditioning.

(7) Any aerobic activity which results in soldiers maintaining their training heart rate as described in FM 21–20 for a minimum of 20 minutes, three to five times per week, is adequate to maintain cardiorespiratory fitness. The intensity of each cardiorespiratory exercise session should be adjusted based on the training objective for that session. Physical training aimed at improving a soldier's muscular strength and endurance should consist of multiple sets of timed exercises. Exercises should be continued until temporary muscle failure (until the individual cannot complete another correct repetition). Muscular strength and endurance sessions should work all major muscle groups of the body. Training sessions will be conducted a minimum of three times a week. Detailed guidance is provided in FM 21–20.

(8) Commanders should design and tailor programs according to the unit METL. Battle-focused physical training will be conducted to prepare soldiers to meet the physical demands of combat, stability operations, and

support operations. FM 21–20 outlines types of programs for units with different missions. Running has always been regarded as one of the best aerobic activities. However, unless the running is balanced with strength, muscular endurance, and load-bearing exercises related to the unit mission, the program is inadequate.

(9) Physiological differences, as well as unit and individual missions, must be considered when designing programs involving soldiers of different gender. Despite the level of conditioning, cardiorespiratory and strength differences between men and women are significant. For example, women generally have to exert more effort to maintain the same pace or to do the same amount of work as men. Commanders will practice the principles outlined in FM 21–20 and apply them to maximize unit and individual soldier development. Soldiers who are pregnant or who are recovering from childbirth will not participate in unit physical fitness programs or the APFT. Pregnant soldiers are exempt from regular physical fitness training within the unit and APFT testing for the duration of the pregnancy and up to 180 days past pregnancy termination. Post-partum soldiers will be cleared by their physician's assistant prior to resuming physical fitness training or testing. Commanders are encouraged to enroll pregnant soldiers in the installation pregnancy fitness program. This program assists pregnant and postpartum soldiers in maintaining fitness throughout their pregnancy and to assist them in returning to prepregnancy fitness levels after pregnancy termination.

(10) Commanders will use FM 21–20, DA Pam 350–21, and DA Pam 350–22 when developing physical fitness training programs for soldiers. These publications provide excellent material to design and tailor programs for soldiers in all kinds of assignments.

(11) Master fitness trainers are soldiers who have completed an approved 2-week Active Army or RC Master Fitness Training Course or a special MFT program at the USMA and the USASMA. These soldiers have received intensive training in the scientific elements of physical fitness and will be used by commanders as special staff assistants to design and maintain individual and unit fitness programs. As resources and school seats allow, all units will have one Master fitness trainer per company.

b. Physical fitness testing gives soldiers an incentive to stay in good physical condition and allows commanders a means of assessing the fitness levels of their units. Accordingly, all Active Army and RC soldiers should be able to pass the APFT at any time.

(1) Physical fitness testing will not form the foundation of unit or individual fitness programs; it is simply one element of a total program. Fitness testing ensures the maintenance of a base level of physical fitness essential for every soldier in the Army, regardless of MOS or duty assignment. Unit programs must take this base level of conditioning and raise it to help meet or exceed mission-related physical performance tasks.

(2) Results of the APFT will be recorded on DA Form 705 (Physical Fitness Test Scorecard) which will be maintained for each soldier. This scorecard will be kept at a central location in the unit and will accompany the individual military personnel records jacket during PCS. Units, separate organizations, and offices will have a system to monitor performance of their soldiers.

(3) Individuals will be weighed when they take record APFTs or at least every 6 months in accordance with AR 600–9.

c. Commanders may establish incentives and unit physical fitness objectives related to their mission essential tasks.

(1) Soldiers who score 270 or above, with a minimum of 90 points per event on the APFT, and meet body composition standards will be awarded the Physical Fitness Badge for physical fitness excellence in accordance with AR 600–8–22. Soldiers are required to meet these criteria during each APFT for record to continue to wear the badge.

(2) Soldiers without medical profiles, who repeatedly fail the APFT, will be barred from re-enlistment or processed for separation from the service. Provisions for separation are in AR 600–8–24 (for officers) or AR 635–200 (for enlisted soldiers) and counterpart ARNG and USAR regulations. A repetitive failure occurs when a soldier fails a record test, the soldier is provided adequate time and assistance to improve his or her performance, and failure occurs again. (See AR 635–100 for officers who have incurred a statutory active duty service obligation because of participation in an Army-sponsored educational or training program.)

d. The Army Sports Program should supplement physical fitness programs. Many sports can be used to promote unit esprit de corps, develop a competitive spirit, increase motivation for fitness development, improve physical fitness, and add variety to unit programs. Vigorous sports such as racket games, soccer, swimming, biking, cross-country skiing, and running enhance fitness. Competitive fitness activities are outlined in FM 21–20.

(1) Commanders may plan and conduct unit-level sports activities. Morale, welfare, and recreation organizations and personnel can provide assistance.

(2) Army physical fitness facilities (gymnasiums and swimming pools) may be used in unit training programs, to include the following:

- (a) Weight training.
 - (b) Circuit training.
 - (c) Hand-to-hand combat.
 - (d) Swimming and drown-proofing.
- (3) Commanders and supervisors should permit their personnel to take part in international competitive events. Participation should be used as a way to promote physical fitness at the highest level of competition. Two international competitive events related to military physical fitness are as follows:
 - (a) The Military Pentathlon (shooting, obstacle running, grenade throwing, utility swimming, and cross-country running).
 - (b) The Confederation of Inter-allied Reserve Officers (known by French acronym CIOR) military skills competition (orienteering, obstacle swimming, shooting, obstacle running, grenade throwing, map reading, and distance estimating).
- e. When conducting physical fitness training in unit formations, the commander will prescribe a uniform proper to weather conditions and the type of activity. This can include appropriate components of the athletic ensemble (Common Table of Allowances (CTA) 50–900) when issued, or it can also include battle dress trousers with undershirt or utility shirt. Female soldiers will not be required to wear the undershirt as an outer garment nor will they be required to remove the utility shirt for physical training. Commanders may authorize the wear of individually purchased athletic clothing for unit sports activities or for physical training.
 - (1) Testing standards are designed for soldiers wearing running shoes. Accordingly, running shoes will be worn for physical fitness testing unless individual soldiers elect to wear combat boots.
 - (2) Commanders should advise soldiers on how to select suitable athletic or running shoes. However, they will not require the purchase of a particular color, brand, or style.
 - (3) The preferred footwear for running is the running shoe. However, some physical training in well-fitted and broken-in boots, to include limited running and rapid road marching, may be appropriate. Activities conducted in combat boots should progressively increase in duration allowing soldiers to adapt to performing in boots. Training in boots will prepare soldiers for running or forced-marches over rough terrain. Commanders must consider the experience of their soldiers and their unit missions when deciding on the footwear for fitness training.

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Student Handout 2

This student handout contains 42 pages of material from the following publication:

FM 21-20, Physical Fitness Training, 30 September 1992

Chapter 1.

INTRODUCTION

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PREFACE

On 5 July 1950, U.S. troops, who were unprepared for the physical demands of war, were sent to battle. The early days of the Korean were nothing short of disastrous, as U.S. soldiers were routed by a poorly equipped but well trained, North Korean People's Army. As American soldiers withdrew, they left behind wounded comrades and valuable equipment; their training had not adequately prepared them to carry heavy loads.

The costly lessons learned by Task Force Smith in Korea are as important today as ever. If we fail to prepare our soldiers for their physically demanding wartime tasks, we are guilty of paying lip service to the principle of "Train as you fight." Our physical training programs must do more for our soldiers than just get them ready for the semiannual Army Physical Fitness Test (APFT).

FM 21-20 is directed at leaders who plan and conduct physical fitness training. It provides guidelines for developing programs which will improve and maintain physical fitness levels for all Army personnel. These programs will help leaders prepare their soldiers to meet the physical demands of war. This manual can also be used as a source book by all soldiers. FM 21-20 was written to conform to the principles outlined in FM 25-100, Training the Force.

The benefits to be derived from a good physical fitness program are many. It can reduce the number of soldiers on profile and sick call, invigorate training, and enhance productivity. It will improve soldiers' combat readiness.

The proponent of this publication is HQ, TRADOC. Send comments and recommendations on DA Form 2028 (Recommended Changes To Publications and Blank Forms) directly to Headquarters, US Army Infantry Center, US Army Physical Fitness School (ATZB-PF), Fort Benning, GA 31905-5000.

Unless this publication states otherwise, masculine nouns and pronouns do not refer exclusively to men.

CHAPTER 1

Introduction

A soldier's level of physical fitness has a direct impact on his combat readiness. The many battles in which American troops have fought underscore the important role physical fitness plays on the battlefield. The renewed nationwide interest in fitness has been accompanied by many research studies on the effects of regular participation in sound physical fitness programs. The overwhelming conclusion is that such programs enhance a person's quality of life, improve productivity, and bring about positive physical and mental changes. Not only are physically fit soldiers essential to the Army, they are also more likely to have enjoyable, productive lives. This chapter provides an overview of fitness. It defines physical fitness, outlines the phases of fitness, and discusses various types of fitness programs and fitness evaluation. Commanders and leaders can use this information to develop intelligent, combat-related, physical fitness programs.

Physical fitness, the emphasis of this manual, is but one component of total fitness. Some of the others are weight control, diet and nutrition, stress management, dental health, and spiritual and ethical fitness, as well as the avoidance of hypertension, substance abuse, and tobacco use. This manual is primarily concerned with issues relating directly to the development and maintenance of the five components of physical fitness.

Components of physical fitness include weight control, diet, nutrition, stress management, and spiritual and ethical fitness.

The Army's physical fitness training program extends to all branches of the total Army. This includes the USAR and ARNG and encompasses all ages and ranks and both sexes. Its purpose is to physically condition all soldiers throughout their careers beginning with initial entry training (IET). It also includes soldiers with limiting physical profiles who must also participate in physical fitness training.

Commanders and leaders must ensure that all soldiers in their units maintain the highest level of physical fitness in accordance with this manual and with AR 350-15 which prescribes policies, procedures, and responsibilities for the Army physical fitness program.

Leadership Responsibilities

Effective leadership is critical to the success of a good physical training program. Leaders, especially senior leaders, must understand and practice the new Army doctrine of physical fitness. They must be visible and active participants in physical training programs. In short, leaders must lead PT. Their example will emphasize the importance of physical fitness training and will highlight it as a key element of the unit's training mission.

Leaders must emphasize the value of physical training and clearly explain the objectives and benefits of the program. Master Fitness Trainers (MFTs), graduates of a special course taught by the U.S. Army Physical Fitness School, can help commanders do this. However, regardless of the level of technical experience MFTs have, the sole responsibility for good programs rests with leaders at every level.

A poorly designed and executed physical fitness program hurts morale. A good program is well planned and organized, has reasonable yet challenging requirements, and is competitive and progressive. It also has command presence at every level with leaders setting the example for their soldiers.

Leaders should also continually assess their units to determine which specific components of fitness they lack. Once they identify the shortcomings, they should modify their programs to correct the weaknesses.

Leaders should not punish soldiers who fail to perform to standard. Punishment, especially excessive repetitions or additional PT, often does more harm than good. Leaders must plan special training to help soldiers who need it. The application of sound leadership techniques is especially important in bringing physically deficient soldiers up to standard.

COMMAND FUNCTIONS

Commanders must evaluate the effectiveness of physical fitness training and ensure that it is focused on the unit's missions. They can evaluate its effectiveness by participating in and observing training, relating their fitness programs to the unit's missions, and analyzing individual and unit APFT performance.

Leaders should regularly measure the physical fitness level of every soldier to evaluate

his progress and determine the success of the unit's program.

Commanders should assure that qualified leaders supervise and conduct fitness training and use their MFTs, for they have received comprehensive training in this area.

Leaders can learn about fitness training in the following ways:

- Attend the four-week MFT course or one-week Exercise Leaders Course.
- Request a fitness workshop from the Army Physical Fitness School.
- Become familiar with the Army's fitness publications. Important examples include this manual, AR 350-15, and DA Pamphlets 350-15, 350-18, and 350-22.

Commanders must provide adequate facilities and funds to support a program which will improve each soldier's level of physical fitness. They must also be sure that everyone participates, since all individuals, regardless of rank, age, or sex, benefit from regular exercise. In some instances, leaders will need to make special efforts to overcome recurring problems which interfere with regular training.

Leaders must also make special efforts to provide the correct fitness training for soldiers who are physically substandard. "Positive profiling" (DA Form 3349) permits and encourages profiled soldiers to do as much as they can within the limits of their profiles. Those who have been away from the conditioning process because of leave, sickness, injury, or travel may also need special consideration.

Commanders must ensure that the time allotted for physical fitness training is used effectively.

Training time is wasted by the following:

- Unprepared or unorganized leaders.
- Assignment of a group which is too large for one leader.
- Insufficient training intensity: it will result in no improvement.
- Rates of progression that are too slow or too fast.
- Extreme formality that usually emphasizes form over substance. An example would be too many units runs at slow paces or "daily dozen" activities that look impressive but do not result in improvement.

- Inadequate facilities which cause long waiting periods between exercises during a workout and/or between workouts.
- Long rest periods which interfere with progress.

To foster a positive attitude, unit leaders and instructors must be knowledgeable, understanding, and fair, but demanding. They must recognize individual differences and motivate soldiers to put forth their best efforts. However, they must also emphasize training to standard. Attaining a high level of physical fitness cannot be done simply by going through the motions. Hard training is essential.

Commanders must ensure that leaders are familiar with approved techniques, directives, and publications and that they use them. The objective of every commander should be to incorporate the most effective methods of physical training into a balanced program. This program should result in the improved physical fitness of their soldiers and an enhanced ability to perform mission-related tasks.

MFTs can help commanders formulate sound programs that will attain their physical training goals, but commanders must know and apply the doctrine. However, since the responsibility for physical training is the commander's, programs must be based on his own training objectives. These he must develop from his evaluation of the unit's mission-essential task list (METL). Chapter 10 describes the development of the unit's program.

MASTER FITNESS TRAINERS

A Master Fitness Trainer (MFT) is a soldier who has completed either the four-week active-component, two-week reserve-component, or U.S. Military Academy's MFT course work. Although called "masters," MFTs are simply soldiers who know about all aspects of physical fitness training and how soldiers' bodies function. Most importantly, since MFTs are taught to design individual and unit programs, they should be used by commanders as special staff assistants for this purpose.

MFTs can do the following:

- Assess the physical fitness levels of individuals and units.
- Analyze the unit's mission-related tasks and develop sound fitness training programs to support those tasks.

- Train other trainers to conduct sound, safe physical training.
- Understand the structure and function of the human body, especially as it relates to exercise.

Components of Fitness

Physical fitness is the ability to function effectively in physical work, training, and other activities and still have enough energy left over to handle any emergencies which may arise.

The components of physical fitness are as follows:

- Cardiorespiratory (CR) endurance - the efficiency with which the body delivers oxygen and nutrients needed for muscular activity and transports waste products from the cells.
- Muscular strength - the greatest amount of force a muscle or muscle group can exert in a single effort.
- Muscular endurance - the ability of a muscle or muscle group to perform repeated movements with a submaximal force for extended periods of time.
- Flexibility - the ability to move the joints (for example, elbow, knee or any group of joints through an entire, normal range of motion.)
- Body composition- the amount of body fat a soldier has in comparison to his total body mass.

Improving the first three components of fitness listed above will have a positive impact on body composition and will result in less fat. Excessive body fat detracts from the other fitness components, reduces performance, detracts from appearance, and negatively affects one's health.

Factors such as speed, agility, muscle power, eye-hand coordination, and eye-foot coordination are classified as components of "motor" fitness. These factors affect a soldier's survivability on the battlefield. Appropriate training can improve these factors within the limits of each soldier's potential. The Army's fitness program seeks to improve or maintain all the components of physical and motor fitness through sound, progressive, mission-specific physical training for individuals and units.

Principles of Exercise

Adherence to certain basic exercise principles is important for developing an effective program. The principles of exercise apply to everyone at all levels of physical training, from the Olympic-caliber athlete to the weekend jogger. They also apply to fitness training for military personnel.

These basic principles of exercise must be followed:

- Regularity. To achieve a training effect, a person must exercise often. One should strive to exercise each of the first four fitness components at least three times a week. Infrequent exercise can do more harm than good. Regularity is also important in resting, sleeping, and following a good diet.
- Progression. The intensity (how hard) and/or duration (how long) of exercise must gradually increase to improve the level of fitness.
- Balance. To be effective, a program should include activities that address all the fitness components, since over-emphasizing any one of them may hurt the others.
- Variety. Providing a variety of activities reduces boredom and increases motivation and progress.
- Specificity. Training must be geared to become better runners if their training emphasizes running. Although swimming is a great exercise, it does not improve a 2-mile-run time as much as a running program does.
- Recovery. A hard day of training for a given component of fitness should be followed by an easier training day or rest day for that component and/or muscle group(s) to help permit recovery. Another way to allow recovery is to alternate the muscle groups exercised every session must exceed the normal demands placed on the body in order to bring about a training effect.
- Overload. The workload of each exercise session must exceed the normal demands placed on the body in order to bring about a training effect.

FITT Factors

Certain factors must be part of any fitness training program for it to be successful. These factors are Frequency, Intensity, Time, and Type. The acronym FITT makes it easier to remember them. (See Figure 1-1.)

FREQUENCY

Army Regulation 350-15 specifies that vigorous physical fitness training will be conducted 3 to 5 times per week. For optimal results, commanders must strive to conduct 5 days of physical training per week. Ideally, at least three exercise sessions for CR fitness, muscle endurance, muscle strength, and flexibility should be performed each week to improve fitness levels. Thus, for example, to obtain maximum gains in muscular strength, soldiers should have at least three strength-training sessions per week. Three physical activity periods a week, however, with only one session each of cardiorespiratory, strength, and flexibility training will not improve any of these three components.

With some planning, a training program for the average soldier can be developed which provides fairly equal emphasis on all the components of physical fitness. The following training program serves as an example.

In the first week, Monday, Wednesday, and Friday are devoted to CR fitness, and Tuesday and Thursday are devoted to muscle endurance and strength. During the second week, the training days are flip-flopped: muscle endurance and strength are trained on Monday, Wednesday, and Friday, and CR fitness is trained on Tuesday and Thursday. Stretching exercises are done in every training session to enhance flexibility. By training continuously in this manner, equal emphasis can be given to developing muscular endurance and strength and to CR fitness while training five days per week.

If the unit's mission requires it, some muscular and some CR training can be done during each daily training session as long as a "hard day/recovery day" approach is used. For example, if a unit has a hard run on Monday, Wednesday, and Friday, it may also choose to run on Tuesday and Thursday. However, on Tuesday and Thursday the intensity and/or

distance/time should be reduced to allow recovery. Depending on the time available for each session and the way training sessions are conducted, all components of fitness can be developed using a three-day-per-week schedule. However, a five-day-per-week program is much better than three per week. (See Training Program in Chapter 10.)

Numerous other approaches can be taken when tailoring a fitness program to meet a unit's mission as long as the principles of exercise are not violated. Such programs, when coupled with good nutrition, will help keep soldiers fit to win.

INTENSITY

Training at the right intensity is the biggest problem in unit programs. The intensity should vary with the type of exercise being done. Exercise for CR development must be strenuous enough to elevate the heart rate to between 60 and 90 percent of the heart rate reserve (HRR). (The calculation of percent HRR is explained in Chapter 2.) Those with low fitness levels should start exercising at a lower training heart rate (THR) of about 60 percent of HRR.

For muscular strength and endurance, intensity refers to the percentage of the maximum resistance that is used for a given exercise. When determining intensity in a strength-training program, it is easier to refer to a "repetition maximum" or "RM." For example, a 10-RM is the maximum weight that can be correctly lifted 10 times. An 8-12 RM is the weight that can be lifted 8 to 12 times correctly. Doing an exercise "correctly" means moving the weight steadily and with proper form without getting help from other muscle groups by jerking, bending, or twisting the body. For the average person who wants to improve both muscular strength and endurance, an 8-12 RM is best.

The person who wants to concentrate on muscular strength should use weights which let him do three to seven repetitions before his muscles fatigue. Thus, for strength development, the weight used should be a 3-7 RM. On the other hand, the person who wants to concentrate on muscular endurance should use a 12+ RM. When using a 12+ RM as the training intensity, the more repetitions performed per set, over time, the greater will be the improvement in muscular endurance.

Conversely, the greater the number of repetitions performed, the smaller will be the gains in strength. For example, a person who regularly trains with a weight which lets him do 100 repetitions per exercise (a 100-RM) greatly increases his muscular endurance but minimally improves his muscular strength. (See Chapter 3 for information on resistance training.)

All exercise sessions should include stretching during the warm-up and cool-down. One should stretch so there is slight discomfort, but no pain, when the movement is taken beyond the normal range of motion. (See Chapter 4 for information on stretching.)

TIME

Like intensity, the time spent exercising depends on the type of exercise being done. At least 20 to 30 continuous minutes of intense exercise must be used in order to improve cardiorespiratory endurance.

For muscular endurance and strength, exercise time equates to the number of repetitions done. For the average soldier, 8 to 12 repetitions with enough resistance to cause muscle failure improves both muscular endurance and strength. As soldiers progress, they will make better strength gains by doing two or three sets of each resistance exercise.

Flexibility exercises or stretches should be held for varying times depending on the objective of the session. For warming-up, such as before a run, each stretch should be held for 10 to 15 seconds. To improve flexibility, it is best to do stretching during the cool-down, with each stretch held for 30 to 60 seconds. If flexibility improvement is a major goal, at least one session per week should be devoted to developing it.

TYPE

Type refers to the kind of exercise performed. When choosing the type, the commander should consider the principle of specificity. For example, to improve his soldiers' levels of CR fitness (the major fitness component in the 2-mile run), he should have them do CR types of exercises. These are discussed in Chapter 2.

Ways to train for muscular strength and endurance are addressed in Chapter 3, while

Chapter 4 discusses flexibility. These chapters will help commanders design programs which are tailor-made to their soldiers' needs. The basic rule is that to improve performance, one must practice the particular exercise, activity, or skill he wants to improve. For example, to be good at push-ups, one must do push-ups. No other exercise will improve push-up performance as effectively.

FITT Factors Applied to Physical Conditioning Program				
Cardiorespiratory Endurance	Muscular Strength	Muscular Endurance	Muscular Strength and Muscular Endurance	Flexibility
Frequency 3-5 times/week	3 times/week	3 times/week	3 times/week	<u>Warm-up and Cool down:</u> stretch before and after each exercise session Developmental Stretching To improve flexibility, stretch 2-3 time/week
Intensity 60-90% HRR*	3-7 RM*	12+ RM	8-12 RM	Tension and slight discomfort, NOT PAIN
Time 20 minutes or more	The time required to do 3-7 repetitions of each exercise	The time required to do 12+ repetitions of each exercise	The time required to do 8-12 repetitions of each exercise	<u>Warm-up and Cool-down Stretches:</u> 10-15 seconds/stretch <u>Developmental Stretches:</u> 30-60 seconds/stretch
Type Running Swimming Cross Country Skiing Rowing Bicycling Jumping Rope Walking/Hiking Stair Climbing	Free Weights Resistance Machine Partner-Resisted Exercises Body-Weight Exercises (Pushups/Situps/Pullups/Dips, Etc.)			<u>Stretching:</u> Static Passive P.N.F.
* HRR = Heart Rate Reserve				
* RM = Repetition Maximum				

Figure 1-1

Warm-up and Cool-Down

One must prepare the body before taking part in organized PT, unit sports competition, or vigorous physical activity. A warm-up may help prevent injuries and maximize performance. The warm-up increases the body's internal temperature and the heart rate. The chance of getting injured decreases when the heart, muscles, ligaments, and tendons are properly prepared for exertion. A warm-up should include some running-in-place or slow jogging, stretching, and calisthenics. It should last five to seven minutes and should occur just before the CR or muscular endurance and strength part of the workout. After a proper warm-up, soldiers are ready for a more intense conditioning activity.

Soldiers should cool down properly after each exercise period, regardless of the type of workout. The cool-down serves to gradually slow the heart rate and helps prevent pooling of the blood in the legs and feet. During exercise, the muscles squeeze the blood through the veins. This helps return the blood to the heart. After exercise, however, the muscles relax and no longer do this, and the blood can accumulate in the legs and feet. This can cause a person to faint. A good cool-down will help avoid this possibility.

Soldiers should walk and stretch until their heart rates return to less than 100 beats per minute (BPM) and heavy sweating stops. This usually happens five to seven minutes after the conditioning session.

Phases of Fitness Conditioning

The physical fitness training program is divided into three phases: preparatory, conditioning, and maintenance. The starting phases for different units or individuals vary depending on their age, fitness levels, and previous physical activity.

Young, healthy persons may be able to start with the conditioning phase, while those who have been exercising regularly may already be in the maintenance phase. Factors such as extended field training, leave time, and illness can cause soldiers to drop from a maintenance to a conditioning phase. Persons who have not been active, especially if they are age 40 or older, should start with the preparatory phase.

Many soldiers who fall into this category may be recovering from illness or injury, or they may be just out of high school. Most units will have soldiers in all three phases of training at the same time.

PREPARATORY PHASE

The preparatory phase helps both the cardiorespiratory and muscular systems get used to exercise, preparing the body to handle the conditioning phase. The work load in the beginning must be moderate. Progression from a lower to a higher level of fitness should be achieved by gradual, planned increases in frequency, intensity, and time.

Initially, poorly conditioned soldiers should run, or walk if need be, three times a week at a comfortable pace that elevates their heart rate to about 60 percent HRR for 10 to 15 minutes. Recovery days should be evenly distributed throughout the week, and training should progress slowly. Soldiers should continue at this or an appropriate level until they have no undue fatigue or muscle soreness the day following the exercise. They should then lengthen their exercise session to 16 to 20 minutes and/or elevate their heart rate to about 70 percent HRR by increasing their pace. To be sure their pace is faster, they should run a known distance and try to cover it in less time. Those who feel breathless or whose heart rate rises beyond their training heart rate (THR) while running should resume walking until the heart rate returns to the correct training level. When they can handle an intensity of 70 percent HRR for 20 to 25 minutes, they should be ready for the next phase. Chapter 2 shows how to determine the THR, that is, the right training level during aerobic training.

The preparatory phase for improving muscular endurance and strength through weight training should start easily and progress gradually. Beginning weight trainers should select about 8 to 12 exercises that work all the body's major muscle groups. They should use only very light weights the first week (that is, the first two to three workouts). This is very important, as they must first learn the proper form for each exercise. Light weights will also help minimize muscle soreness and decrease the likelihood of injury to the muscles, joints, and ligaments. During the second week, they should

use progressively heavier weights on each resistance exercise. By the end of the second week (four to six workouts), they should know how much weight will let them do 8 to 12 repetitions to muscle failure for each exercise. At this point the conditioning phase begins.

CONDITIONING PHASE

To reach the desired level of fitness, soldiers must increase the amount of exercise and/or the workout intensity as their strength and/or endurance increases.

To improve cardiorespiratory endurance, for example, they must increase the length of time they run. They should start with the preparatory phase and gradually increase the running time by one or two minutes each week until they can run continuously for 20 to 30 minutes. At this point, they can increase the intensity until they reach the desired level of fitness. They should train at least three times a week and take no more than two days between workouts.

For weight trainers, the conditioning phase normally begins during the third week. They should do one set of 8 to 12 repetitions for each of the selected resistance exercises. When they can do more than 12 repetitions of any exercise, they should increase the weight used on that exercise by about five percent so they can again do only 8 to 12 repetitions. This process continues throughout the conditioning phase. As long as they continue to progress and get stronger while doing only one set of each exercise, it is not necessary for them to do more than one set per exercise. When they stop making progress with one set, they should add another set on those exercises in which progress has slowed. As training progresses, they may want to increase the sets to three to help promote further increases in strength and/or muscle mass.

Soldiers and units should be encouraged to progress beyond minimum requirements.

For maximum benefit, soldiers should do strength training three times a week with 48 hours of rest between workouts for any given muscle group. It helps to periodically do a different type of exercise for a given muscle or muscle group. This adds variety and ensures better strength development.

The conditioning phase ends when a soldier is physically mission-capable and all personal, strength-related goals and unit-fitness goals have been met.

MAINTENANCE PHASE

The maintenance phase sustains the high level of fitness achieved in the conditioning phase. The emphasis here is no longer on progression. A well-designed, 45- to 60-minute workout (including warm-up and cool-down) at the right intensity three times a week is enough to maintain almost any appropriate level of physical fitness. These workouts give soldiers time to stabilize their flexibility, CR endurance, and muscular endurance and strength. However, more frequent training may be needed to reach and maintain peak fitness levels.

Soldiers and units should always be encouraged to progress beyond minimum requirements. Maintaining an optimal level of fitness should become part of every soldier's life-style and should be continued throughout his life.

An effective program uses a variety of activities to develop muscular endurance and strength, CR endurance, and flexibility, and to achieve good body composition. It should also promote the development of coordination as well as basic physical skills. (See Chapter 10 for guidance in constructing a unit program.)

Types of Fitness Programs

The Army has too many types of units with different missions to have one single fitness program for everyone. Therefore, only broad categories of programs and general considerations are covered here. They are classified as unit, individual, and special programs.

UNIT PROGRAMS

Unit programs must support unit missions. A single unit may require several types of programs. Some units, such as infantry companies, have generally the same types of soldiers and MOSS. On the other hand, certain combat-service-support units have many different types of soldiers, each with unique needs. Commanders can develop programs for

their own unit by following the principles in this chapter. MFTs know how to help commanders develop programs for their units/soldiers.

Commanders of units composed of both men and women must also understand the physiological differences between the sexes. These are summarized in Appendix A. Although women are able to participate in the same fitness programs as men, they must work harder to perform at the same absolute level of work or exercise. The same holds true for poorly-conditioned soldiers running with well conditioned soldiers.

To overcome this problem in the case of running, for example, the unit should use ability group runs rather than unit runs. Soldiers in a given ability group will run at a set pace, with groups based on each soldier's most recent 2-mile-run time. Three to six groups per company-sized unit are usually enough. Within each group, each soldier's heart rate while running should be at his own THR. When the run is not intense enough to bring one or more of the soldiers to THR, it is time for those soldiers to move up to the next ability group.

Ability group running does two things more effectively than unit runs:

1) it lets soldiers improve to their highest attainable fitness level; and, 2) it more quickly brings subpar performers up to minimum standards.

It also allows soldiers to train to excel on the APFT which, in turn, helps promotion opportunities. Holding a fit soldier back by making him run at a slow, unit-run pace (normally less than his minimum pace for the 2 mile run on the APFT) hurts his morale and violates the principle of training to challenge.

Initial Entry Training (IET)

The training program in basic training (BT) brings soldiers up to the level of physical fitness they need to do their jobs as soldiers. However, the program requires good cadre leadership to ensure that it is appropriate, demanding, and challenging.

Trainees report to active duty at various levels of physical fitness and ability. During basic training they pass through the preparatory into the conditioning phase. During "fill" periods and the first week of training, the focus is on learning and developing the basics of

physical fitness.

Training emphasizes progressive conditioning of the whole body. To minimize the risk of injury, exercises must be done properly, and the intensity must progress at an appropriate rate. Special training should be considered for soldiers who fail to maintain the unit's or group's rate of progression. Commanders should evaluate each basic trainee who falls below standard and give him individualized, special assistance to improve his deficiencies.

Additional training should not be used as punishment for a soldier's inability to perform well.

More PT is not necessarily better. Chapter 11 describes how to develop physical training programs in IET units.

Advanced Individual Training (AIT)

Although AIT focuses on technical and MOS-oriented subjects, physical fitness must be emphasized throughout. Most soldiers arriving from basic training are already well into the conditioning phase. Therefore, AIT unit training should focus on preparing soldiers to meet the physical requirements of their initial duty assignments. (See TRADOC Reg. 350-6, Chapter 4.)

Walking, running, and climbing during unit training contribute to physical fitness, but they are not enough. Physical training in AIT requires continued, regular, vigorous exercise which stresses the whole body and addresses all the components of fitness.

By the end of AIT, soldiers must meet APFT standards. With good programs and special training, all healthy AIT graduates should easily be able to demonstrate that they, possess the required level of physical fitness.

TOE and TDA Units--Active Component

There are many types of units in the Army, and their missions often require different levels of fitness. TOE and TDA units must emphasize attaining and maintaining the fitness level required for the mission.

The unit's standards may exceed the Army's minimums. By regulation (AR 350-15), the unit's standards can be established by the unit's commander, based on mission requirements.

TOE and TDA Units--Reserve Components

The considerations for the active component also apply to reserve components (RCS). However, since members of RC units cannot participate together in collective physical training on a regular basis, RC unit programs must focus on the individual's fitness responsibilities and efforts. Commanders, however, must still ensure that the unit's fitness level and individual PT programs are maintained. MFTs can give valuable assistance to RC commanders and soldiers.

INDIVIDUAL PROGRAMS

Many soldiers are assigned to duty positions that offer little opportunity to participate in collective unit PT programs. Examples are HQDA, MACOM staffs, hospitals, service school staff and faculty, recruiting, and ROTC. In such organizations, commanders must develop leadership environments that encourage and motivate soldiers to accept individual responsibility for their own physical fitness. Fitness requirements are the same for these personnel as for others. Section chiefs and individual soldiers need to use the fundamental principles and techniques outlined in this manual to help them attain and maintain a high level of physical fitness. MFTs can help develop individual fitness programs.

SPECIAL PROGRAMS

The day-to-day unit PT program conducted for most soldiers may not be appropriate for all unit members. Some of them may not be able to exercise at the intensity or duration best suited to their needs.

At least three groups of soldiers may need special PT programs. They are as follows:

- Those who fail the APFT and do not have medical profiles.
- Those who are overweight/overfat according to AR 600-9
- Those who have either permanent or

temporary medical profiles.

Leaders must also give special consideration to soldiers who are age 40 or older and to recent arrivals who cannot meet the standards of their new unit.

Special programs must be tailored to each soldier's needs, and trained, knowledgeable leaders should develop and conduct them. This training should be conducted with the unit. If this is impossible, it should at least occur at the same time.

There must be a positive approach to all special fitness training. Soldiers who lack enough upper body strength to do a given number of push-ups or enough stamina to pass the 2-mile run should not be ridiculed. Instead, their shortcomings should be assessed and the information used to develop individualized programs to help them remedy their specific shortcomings. A company-sized unit may have as many as 20 soldiers who need special attention. Only smart planning will produce good programs for all of them.

Commanders must counsel soldiers, explaining that special programs are being developed in their best interests. They must make it clear that standards will be enforced. Next, they should coordinate closely with medical personnel to develop programs that fit the capabilities of soldiers with medical limitations. Each soldier should then begin an individualized program based on his needs.

MFTs know how to assess CR endurance, muscular strength and endurance, flexibility, and body composition. They can also develop thorough, tailor-made programs for all of a unit's special population.

APFT Failures

Although it is not the heart of the Army's physical fitness program, the APFT is the primary instrument for evaluating the fitness level of each soldier. It is structured to assess the muscular endurance of specific muscle groups and the functional capacity of the CR system.

Soldiers with reasonable levels of overall physical fitness should easily pass the APFT. Those whose fitness levels are substandard will fail. Soldiers who fail the APFT must receive special attention. Leaders should analyze their

weaknesses and design programs to overcome them. For example, if the soldier is overweight, nutrition and dietary counseling may be needed along with a special exercise program. DA Pam 350-22 outlines several ways to improve a soldier's performance on each of the APFT events.

When trying to improve APFT performances, leaders must ensure that soldiers are not overloaded to the point where the fitness training becomes counterproductive. They should use ability groups for their running program and, in addition to a total-body strength-training program, should include exercises designed for push-up and sit-up improvement. When dealing with special populations, two very important principles are overload and recovery. The quality, not just the quantity, of the workout should be emphasized. Two-a-day sessions, unless designed extremely well, can be counter-productive. More PT is not always better.

Overweight Soldiers

Designers of weight loss and physical training programs for overweight soldiers should remember this: even though exercise is the key to sensible weight loss, reducing the number of calories consumed is equally important. A combination of both actions is best.

The type of exercise the soldier does affects the amount and nature of the weight loss. Both running and walking burn about 100 calories per mile. One pound of fat contains 3,500 calories. Thus, burning one pound of fat through exercise alone requires a great deal of running or walking. On the other hand, weight lost through dieting alone includes the loss of useful muscle tissue. Those who participate in an exercise program that emphasizes the development of strength and muscular endurance, however, can actually increase their muscle mass while losing body fat. These facts help explain why exercise and good dietary practices must be combined.

Unit MFTs can help a soldier determine the specific caloric requirement he needs to safely and successfully lose excess fat. They can devise a sound, individualized plan to arrive at that reduced caloric intake. Likewise, unit MFTs can also develop training programs which will lead to fat loss without the loss of useful muscle

tissue.

Generally, overweight soldiers should strive to reduce their fat weight by two pounds per week. When a soldier loses weight, either by diet or exercise or both, a large initial weight loss is not unusual. This may be due to water loss associated with the using up of the body's carbohydrate stores. Although these losses may be encouraging to the soldier, little of this initial weight loss is due to the loss of fat.

Soldiers should be weighed under similar circumstances and at the same time each day. This helps avoid false measurements due to normal fluctuations in their body weight during the day. As a soldier develops muscular endurance and strength, lean muscle mass generally increases. Because muscle weighs more per unit of volume than fat, caution is advised in assessing his progress. Just because a soldier is not losing weight rapidly does not necessarily mean he is not losing fat. In fact, a good fitness program often results in gaining muscle mass while simultaneously losing fat weight. If there reasonable doubt, his percentage body fat should be determined.

Soldiers with Profiles

This manual stresses what soldiers can do while on medical profile rather than what they cannot do.

DOD Directive 1308.1 requires that, "Those personnel identified with medically limiting defects shall be placed in a physical fitness program consistent with their limitations as advised by medical authorities."

AR 350-15 states, "For individuals with limiting profiles, commanders will develop physical fitness programs in cooperation with health care personnel."

The Office of the Surgeon General has developed DA Form 3349 to ease the exchange of information between health care personnel and the units. On this form, health care personnel list, along with limitations, those activities that the profiled soldier can do to maintain his fitness level. With this information, the unit should direct profiled soldiers to participate in the activities they can do. (An example of DA Form 3349 is in Appendix B.)

All profiled soldiers should take part in as much of the regular fitness program as they can. Appropriate activities should be substituted to

replace those regular activities in which they cannot participate.

Chapter 2 describes some aerobic activities the soldier can do to maintain cardiorespiratory fitness when he cannot run. Chapter 3 shows how to strengthen each body part. Applying this information should allow some strength training to continue even when body parts are injured. The same principle applies to flexibility (Chapter 4).

Medical treatment and rehabilitation should be aimed at restoring the soldier to a suitable level of physical fitness. Such treatment should use appropriate, progressive physical activities with medical or unit supervision.

MFTs can help profiled soldiers by explaining alternative exercises and how to do them safely under the limitations of their profile. MFTs are not, however, trained to diagnose injuries or prescribe rehabilitative exercise programs. This is the domain of qualified medical personnel.

The activity levels of soldiers usually decrease while they are recovering from sickness or injury. As a result, they should pay special attention to their diets to avoid gaining body fat. This guidance becomes more important as soldiers grow older. With medical supervision, proper diet, and the right PT programs, soldiers should be able to overcome their physical profiles and quickly return to their normal routines and fitness levels.

Age as a Factor in Physical Fitness

Soldiers who are age 40 and older represent the Army's senior leadership. On the battlefield, they must lead other soldiers under conditions of severe stress. To meet this challenge and set a good example, these leaders must maintain and demonstrate a high level of physical fitness. Since their normal duties may be stressful but nonphysical, they must take part regularly in a physical fitness program. The need to be physically fit does not decrease with increased age.

People undergo many changes as they grow older. For example, the amount of blood the heart can pump per beat and per minute decreases during maximal exercise, as does the maximum heart rate. This lowers a person's physical ability, and performance suffers. Also, the percent of body weight composed of fat

generally increases, while total muscle mass decreases. The result is that muscular strength and endurance, CR endurance, and body composition suffer. A decrease in flexibility also occurs.

Men tend to maintain their peak levels of muscular strength and endurance and CR fitness until age 30. After 30 there is a gradual decline throughout their lives. Women tend to reach their peak in physical capability shortly after puberty and then undergo a progressive decline.

Although a decline in performance normally occurs with aging, those who stay physically active do not have the same rate of decline as those who do not. Decreases in muscular strength and endurance, CR endurance, and flexibility occur to a lesser extent in those who regularly train these fitness components.

Soldiers who are fit at age 40 and continue to exercise show a lesser decrease in many of the physiological functions related to fitness than do those who seldom exercise. A trained 60-year-old, for example, may have the same level of CR fitness as a sedentary 20-year-old. In short, regular exercise can help add life to your years and years to your life.

The assessment phase of a program is especially important for those ages 40 and over. However, it is not necessary or desirable to develop special fitness programs for these soldiers. Those who have been exercising regularly may continue to exercise at the same level as they did before reaching age 40. A program based on the principles of exercise and the training concepts in this manual will result in a safe, long-term conditioning program for all soldiers. Only those age 40 and over who have not been exercising regularly may need to start their exercise program at a lower level and progress more slowly than younger soldiers. Years of inactivity and possible abuse of the body cannot be corrected in a few weeks or months.

As of 1 January 1989, soldiers reaching age 40 are no longer required to get clearance from a cardiovascular screening program before taking the APFT. Only a medical profile will exempt them from taking the biannual record APFT. They must, however, have periodic physical examinations in accordance with AR 40-501 and NGR 40-501. These include screening for cardiovascular risk factors.

Evaluation

To evaluate their physical fitness and the effectiveness of their physical fitness training programs, all military personnel are tested biannually using the APFT in accordance with AR 350-15. (Refer to Chapter 14.) However, commanders may evaluate their physical fitness programs more frequently than biannually.

The objective of physical training in the Army is to enhance soldiers' abilities to meet the physical demands of war. Any physical training which results in numerous injuries or accidents is detrimental to this goal. As in most training, common sense must prevail. Good, sound physical training should challenge soldiers but situations where accidents or injuries are likely to occur.

SCORING CATEGORIES

There are two APFT categories of testing for all military personnel Initial Entry Training (IET) and the Army Standard.

IET Standard

The APFT standard for basic training is a minimum of 50 points per event and no less than 150 points overall by the end of basic training. Graduation requirements for AIT and One Station Unit Training (OSUT) require 60 points per event.

Army Standard

All other Army personnel (active and reserve) who are non-IET soldiers must attain the minimum Army standard of at least 60 points per event. To get credit for a record APFT, a medically profiled soldier must, as a minimum, complete the 2-mile run or one of the alternate aerobic events.

SAFETY

Safety is a major consideration when planning and evaluating physical training programs. Commanders must ensure that the programs do not place their soldiers at undue risk of injury or accident. They should address the following items:

- Environmental conditions (heat/cold /traction).
- Soldiers' levels of conditioning (low/high/age and sex).
- Facilities (availability /instruction /repair).
- Traffic (routes/procedures/formations).
- Emergency procedures (medical/ communication/transport).

CHAPTER 2

Cardiorespiratory Fitness

Cardiorespiratory (CR) fitness, sometimes called CR endurance, aerobic fitness, or aerobic capacity, is one of the five basic components of physical fitness. CR fitness is a condition in which the body's cardiovascular (circulatory) and respiratory systems function together, especially during exercise or work, to ensure that adequate oxygen is supplied to the working muscles to produce energy. CR fitness is needed for prolonged, rhythmic use of the body's large muscle groups. A high level of CR fitness permits continuous physical activity without a decline in performance and allows for rapid recovery following fatiguing physical activity.

Activities such as running, road marching, bicycling, swimming, cross-country skiing, rowing, stair climbing, and jumping rope place an extra demand on the cardiovascular and respiratory systems. During exercise, these systems attempt to supply oxygen to the working muscles. Most of this oxygen is used to produce energy for muscular contraction. Any activity that continuously uses large muscle groups for 20 minutes or longer taxes these systems. Because of this, a wide variety of training methods is used to improve cardiorespiratory endurance.

Physiology of Aerobic Training

Aerobic exercise uses oxygen to produce most of the body's energy needs. It also brings into play a fairly complex set of physiological events.

- To provide enough energy- producing oxygen to the muscles, the following events occur:
- Greater movement of air through the lungs.
- Increased movement of oxygen from the lungs into the blood stream.
- Increased delivery of oxygen - laden blood to the working muscles by the heart's accelerated pumping action.

- Regulation of the blood vessel's size to distribute blood away from inactive tissue to working muscle.
- Greater movement of oxygen from the blood into the muscle tissue.
- Accelerated return of venous blood to the heart.

Correctly performed aerobic exercise, overtime, causes positive changes in the body's CR system. These changes allow the heart and vascular systems to deliver more oxygen-rich blood to the working muscles during exercise. Also, those muscles regularly used during aerobic exercise undergo positive changes. By using more oxygen, these changes let the muscles make and use more energy during exercise and, as a result, the muscles can work longer and harder.

During maximum aerobic exercise, the trained person has an increased maximum oxygen consumption (VO_2max). He is better able to process oxygen and fuel and can therefore provide more energy to the working muscles.

VO_2max , also called aerobic capacity, is the most widely accepted single indicator of one's CR fitness level.

The best way to determine aerobic capacity is to measure it in the laboratory. It is much easier, however, to estimate maximum oxygen uptake by using other methods.

It is possible to determine a soldier's CR fitness level and get an accurate estimate of his aerobic capacity by using his APFT 2-mile-run time. (Appendix F explains how to do this.) Other tests - the bicycle, walk, and step tests - may also be used to estimate one's aerobic capacity and evaluate one's CR fitness level.

In the presence of oxygen, muscle cells produce energy by breaking down carbohydrates and fats. In fact, fats are only used as an energy source when oxygen is present. Hence, aerobic exercise is the best type of activity for attaining and maintaining a low percentage of body fat.

A person's maximum aerobic capacity can be modified through physical training. To

reach very high levels of aerobic fitness, one must train hard. The best way to improve CR fitness is to participate regularly in a demanding aerobic exercise program.

Many factors can negatively affect one's ability to perform well aerobically. These include the following:

- Age.
- Anemia.
- Carbon monoxide from tobacco smoke or pollution.
- High altitude (reduced oxygen pressure).
- Illness (heart disease).
- Obesity.
- Sedentary life-style.

Any condition that reduces the body's ability to bring in, transport, or use oxygen reduces a person's ability to perform aerobically. Inactivity causes much of the decrease in physical fitness that occurs with increasing age. Some of this decrease in aerobic fitness can be slowed by taking part in a regular exercise program.

Certain medical conditions also impair the transport of oxygen. They include diseases of the lungs, which interfere with breathing, and disabling heart conditions. Another is severe blocking of the arteries which inhibits blood flow to the heart and skeletal muscles.

Smoking can lead to any or all of the above problems and can, in the long and short term, adversely affect one's ability to do aerobic exercise.

FITT Factors

As mentioned in Chapter 1, a person must integrate several factors into any successful fitness training program to improve his fitness level. These factors are summarized by the following words which form the acronym FITT. Frequency, Intensity, Time, and Type. They are described below as they pertain to cardiorespiratory fitness. A warm-up and cool-down should also be part of each workout. Information on warming up and cooling down is given in Chapters 1 and 4.

FREQUENCY

Frequency refers to how often one exercises. It is related to the intensity and duration of the exercise session. Conditioning the CR system can best be accomplished by three adequately intense workouts per week. Soldiers should do these on alternate days. By building up gradually, soldiers can get even greater benefits from working out five times a week. However, leaders should recognize the need for recovery between hard exercise periods and should adjust the training intensity accordingly. They must also be aware of the danger of overtraining and recognize that the risk of injury increases as the intensity and duration of training increases.

INTENSITY

Intensity is related to how hard one exercises. It represents the degree of effort with which one trains and is probably the single most important factor for improving performance. Unfortunately, it is the factor many units ignore.

Changes in CR fitness are directly related to how hard an aerobic exercise is performed. The more energy expended per unit of time, the greater the intensity of the exercise. Significant changes in CR fitness are brought about by sustaining training heart rates in the range of 60 to 90 percent of the heart rate reserve (HRR). Intensities of less than 60 percent HRR are generally inadequate to produce a training effect, and those that exceed 90 percent HRR can be dangerous.

Soldiers should gauge the intensity of their workouts for CR fitness by determining and exercising at their training heart rate (THR). Using the THR method lets them find and prescribe the correct level of intensity during CR exercise. By determining one's maximum heart rate, resting heart rate, and relative conditioning level, an appropriate THR or intensity can be prescribed.

One's ability to monitor the heart rate is the key to success in CR training. (Note: Ability-group running is better than unit running because unit running does not accommodate the individual soldier's THR. For example, some soldiers in a formation may be training at 50 percent HRR and others

at 95 percent HRR. As a result, the unit run will be too intense for some and not intense enough for others.)

The heart rate during work or exercise is an excellent indicator of how much effort a person is exerting. Keeping track of the heart rate lets one gauge the intensity of the CR exercise being done. With this information, one can be sure that the intensity is enough to improve his CR fitness level.

Following are two methods for determining training heart rate (THR). The first method, percent maximum heart rate (% MHR), is simpler to use, while the second method, percent heart rate reserve (%HRR), is more accurate. Percent HRR is the recommended technique for determining THR.

Intensity is probably the single most important factor for improving performance.

Percent MHR Method

With this method, the THR is figured using the estimated maximal heart rate. A soldier determines his estimated maximum heart rate by subtracting his age from 220. Thus, a 20-year-old would have an estimated maximum heart rate (MHR) of 200 beats per minute ($220 - 20 = 200$).

By determining one's maximum heart rate, resting rate, and conditioning level, an appropriate THR can be prescribed.

To figure a THR that is 80 percent of the estimated MHR for a 20-year-old soldier in good physical condition, multiply 0.80 times the MHR of 200 beats per minute (BPM). This example is shown below.

FORMULA

$$\% \times \text{MHR} = \text{THR}$$

CALCULATION

$$0.80 \times 200 \text{ BPM} = 160 \text{ BPM}$$

When using the MHR method, one must compensate for its built-in weakness. A person using this method may exercise at an intensity which is not high enough to cause a training effect. To compensate for this, a person who is in poor shape should exercise at 70 percent of

his MHR; if he is in relatively good shape, at 80 percent MHR; and, if he is in excellent shape, at 90 percent MHR.

Percent HRR Method

A more accurate way to calculate THR is the percent HRR method. The range from 60 to 90 percent HRR is the THR range in which people should exercise to improve their CR fitness levels. If a soldier knows his general level of CR fitness, he can determine which percentage of HRR is a good starting point for him. For example, if he is in excellent physical condition, he could start at 85 percent of his HRR; if he is in reasonably good shape, at 70 percent HRR; and, if he is in poor shape, at 60 percent HRR.

Most CR workouts should be conducted with the heart rate between 70 to 75 percent HRR to attain, or maintain, an adequate level of fitness. Soldiers who have reached a high level of fitness may derive more benefit from working at a higher percentage of HRR, particularly if they cannot find more than 20 minutes for CR exercise. Exercising at any lower percentage of HRR does not give the heart, muscles, and lungs an adequate training stimulus.

Before anyone begins aerobic training, he should know his THR (the heart rate at which he needs to exercise to get a training effect).

The example below shows how to figure the THR by using the resting heart rate reserve (HRR). A 20-year-old male soldier in reasonably good physical shape is the example.

Step 1: Determine the MHR by subtracting the soldier's age from 220.

FORMULA

$$220 - \text{age} = \text{MHR}$$

(GIVEN)

$$220 - 20 = 200 \text{ BPM}$$

STEP 2: Determine the RHR in beats per minute (BPM) by counting the resting pulse for 30 seconds, and multiply the count by two. A shorter period can be used, but a 30-second count is more accurate. This count should be taken while the soldier is completely relaxed

and rested. How to determine heart rate reserve (HRR) by subtracting the RHR from the estimated MHR. If the soldier's RHR IS 69 BPM, the HRR is calculated as shown here.

FORMULA

$$\text{MHR} - \text{RHR} = \text{HRR}$$

CALCULATION

$$200 \text{ BPM} - 69 \text{ BPM} = 131 \text{ BPM}$$

STEP 3: Calculate the THR based on 70 percent of HRR (a percentage based on a good level of CR fitness).

FORMULA

$$(\% \times \text{HRR}) + \text{RHR} = \text{THR}$$

CALCULATION

$$(0.70 \times 131 \text{ BPM}) + 69 \text{ BPM} = 160.7 \text{ BPM}$$

As shown, the percentage (70 percent in this example) is converted to the decimal form (0.70) before it is multiplied by the HRR. The result is then added to the resting heart rate (RHR) to get the THR. Thus, the product obtained by multiplying 0.70 and 131 is 91.7. When 91.7 is added to the RHR of 69, a THR of 160.7 results. When the calculations produce a fraction of a heart beat, as in the example, the value is rounded off to the nearest whole number. In this case, 160.7 BPM is rounded off to give a THR of 161 BPM. In summary, a reasonably fit 20-year-old soldier with a resting heart rate of 69 BPM has a training heart rate goal of 161 BPM. To determine the RHR, or to see if one is within the THR during and right after exercise, place the tip of the third finger lightly over one of the carotid arteries in the neck. These arteries are located to the left and right of the Adam's apple. (See Figure 2-1A.) Another convenient spot from which to monitor the pulse is on the radial artery on the wrist just above the base of the thumb. (See Figure 2-1B.) Yet another way is to place the hand over the heart and count the number of heartbeats. (See Figure 2-1 C.)

During aerobic exercise, the body will usually have reached a "Steady State" after five minutes of exercise, and the heart rate will have leveled off. At this time, and immediately after exercising, the soldier should monitor his

heart rate.

He should count his pulse for 10 seconds, then multiply this by six to get his heart rate for one minute. This will let him determine if his training intensity is high enough to improve his CR fitness level.

For example, use the THR of 161 BPM figured above. During the 10-second period, the soldier should get a count of 27 beats ($161/6 = 26.83$ or 27) if he is exercising at the right intensity. If his pulse rate is below the THR, he must exercise harder to increase his pulse to the THR. If his pulse is above the THR, he should normally exercise at a lower intensity to reduce the pulse rate to the prescribed THR. He should count as accurately as possible, since one missed beat during the 10-second count, multiplied by six, gives an error of six BPM.

A soldier who maintains his THR throughout a 20- to 30-minute exercise period is doing well and can expect improvement in his CR fitness level. He should check his exercise and post-exercise pulse rate at least once each workout. If he takes only one pulse check, he should do it five minutes into the workout.

Figure 2-2 is a chart that makes it easy to determine what a soldier's THR should be during a 10-second count. Using this figure, a soldier can easily find his own THR just by knowing his age and general fitness level. For example, a 40-year-old soldier with a low fitness level should, during aerobic exercise, have a THR of 23 beats in 10 seconds. He can determine this from the table by locating his age and then tracking upward until he reaches the percent HRR for his fitness level. Again, those with a low fitness level should work at about 60 percent HRR and those with a good fitness level at 70 percent HRR. Those with a high level of fitness may benefit most by training at 80 to 90 percent HRR.

Another way to gauge exercise intensity is "perceived exertion." This method relies on how difficult the exercise seems to be and is described in Appendix G.

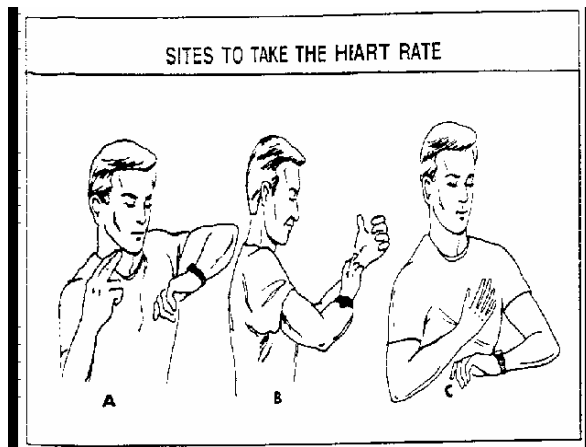


Figure 2-1

TIME

Time, or duration, refers to how long one

exercises. It is inversely related to intensity. The more intense the activity, the shorter the time needed to produce and maintain a training effect; the less intense the activity, the longer the required duration. To improve CR fitness, the soldier must train for at least 20 to 30 minutes at his THR.

TYPE

Only aerobic exercises that require breathing in large volumes of air improve CR fitness. Worthwhile aerobic activities must involve the use of large muscle groups and must be rhythmic. They must also be of sufficient duration and intensity (60 to 90)

TRAINING HEART RATE

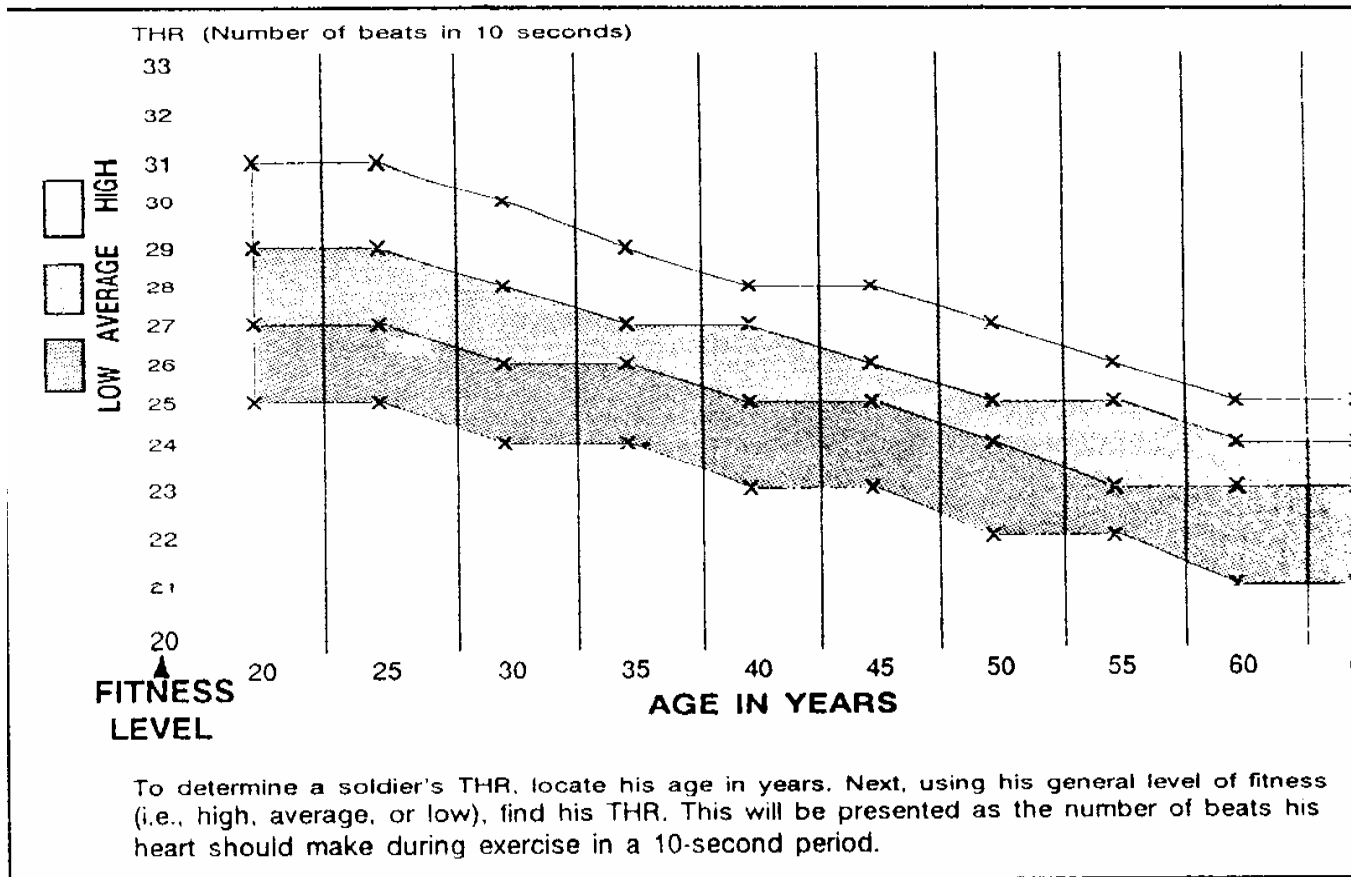


Figure 2-2

percent HRR). Examples of primary and secondary exercises for improving CR fitness are as follows:

PRIMARY

- Running.
- Rowing.
- Jogging.
- Skiing (cross-country).
- Walking (vigorous).
- Exercising to music.
- Road marching.
- Rope skipping.
- Bicycling (stationary).
- Swimming.
- Bicycling (road/street).
- Stair climbing.

SECONDARY (Done with partners or opponents of equal or greater ability.)

- Racquetball (singles).
- Basketball (full court).
- Handball (singles).
- Tennis (singles).

The primary exercises are more effective than the secondary exercises in producing positive changes in CR fitness.

The secondary activities may briefly elevate the heart rate but may not keep it elevated to the THR throughout the entire workout.

Every activity has its advantages and disadvantages. Trainers must weigh these and design programs that fit the unit's needs.

Running

Running enables the body to improve the transport of blood and oxygen to the working muscles and brings about positive changes in the muscles' ability to produce energy. Running fits well into any physical training program because a training effect can be attained with only three 20-minute workouts per week.

Some soldiers may need instruction to improve their running ability. The following style of running is desired. The head is erect with the body in a straight line or slightly bent forward at the waist. The elbows are bent so the forearms are relaxed and held loosely at waist level. The arms swing naturally from

front to rear in straight lines. (Cross-body arm movements waste energy. The faster the run, the faster the arm action.) The toes point straight ahead, and the feet strike on the heel and push off at the big toe.

Besides learning running techniques, soldiers need information on ways to prevent running injuries. The most common injuries associated with PT in the Army result from running and occur to the feet, ankles, knees, and legs. Proper warm-up and cool-down, along with stretching exercises and wearing appropriate clothing and well-fitting running shoes, help prevent injuries. Important information on safety factors and common running injuries is presented in Chapter 13 and Appendix E.

Failure to allow recovery between hard bouts of running cannot only lead to overtraining, but can also be a major cause of injuries. A well-conditioned soldier can run five to six times a week. However, to do this safely, he should do two things: 1) gradually buildup to running that frequently; and, 2) vary the intensity and/or duration of the running sessions to allow recovery between them.

CHAPTER 3

Muscular Endurance and Strength

On today's battlefield, in addition to cardiorespiratory fitness, soldiers need a high level of muscular endurance and strength. In a single day they may carry injured comrades, move equipment, lift heavy tank or artillery rounds, push stalled vehicles, or do many other strength-related tasks. For example, based on computer-generated scenarios of an invasion of Western Europe, artillerymen may have to load from 300 to 500, 155mm-howitzer rounds (95-lb rounds) while moving from 6 to 10 times each day over 8 to 12 days. Infantrymen may need to carry loads exceeding 100 pounds over great distances, while supporting units will deploy and displace many times. Indeed, survival on the battlefield may, in large part, depend on the muscular endurance and strength of the individual soldier.

Muscular Fitness

Muscular fitness has two components: muscular strength and muscular endurance.

Muscular strength is the greatest amount of force a muscle or muscle group can exert in a single effort.

Muscular endurance is the ability of a muscle or muscle group to do repeated contractions against a less-than-maximum resistance for a given time.

Although muscular endurance and strength are separate fitness components, they are closely related. Progressively working against resistance will produce gains in both of these components.

Muscular Contractions

Isometric, isotonic, and isokinetic muscular endurance and strength are best produced by regularly doing each specific kind of contraction. They are described here.

Isometric contraction produces contraction but no movement, as when pushing against a wall. Force is produced with no change in the angle of the joint. Isotonic contraction causes

a joint to move through a range of motion against a constant resistance. Common examples are push-ups, sit-ups, and the lifting of weights.

Isokinetic contraction causes the angle at the joint to change at a constant rate, for example, at 180 degrees per second. To achieve a constant speed of movement, the load or resistance must change at different joint angles to counter the varying forces produced by the muscle(s) at different angles. This requires the use of isokinetic machines. There are other resistance-training machines which, while not precisely controlling the speed of movement, affect it by varying the resistance throughout the range of motion. Some of these devices are classified as pseudo-isokinetic and some as variable-resistance machines.

Isotonic and isokinetic contractions have two specific phases - the concentric or "positive" phase and the eccentric or "negative" phase. In the concentric phase (shortening) the muscle contracts, while in the eccentric phase (elongation) the muscle returns to its normal length. For example, on the upward phase of the biceps curl, the biceps are shortening. This is a concentric (positive) contraction. During the lowering phase of the curl the biceps are lengthening. This is an eccentric (negative) contraction.

A muscle can control more weight in the eccentric phase of contraction than it can lift concentrically. As a result, the muscle may be able to handle more of an overload eccentrically. This greater overload, in return, may produce greater strength gains. The nature of the eccentric contraction, however, makes the muscle and connective tissue more susceptible to damage, so there is more muscle soreness following eccentric work.

When a muscle is overloaded, whether by isometric, isotonic, or isokinetic contractions, it adapts by becoming stronger. Each type of contraction has advantages and disadvantages, and each will result in strength gains if done properly.

The above descriptions are more important to those who assess strength than to average people trying to develop strength and endurance. Actually, a properly design-ed weight training program with free weights or resistance machines will result in

improvements in all three of these categories.

Principles of Muscular Training

To have a good exercise program, the seven principles of exercise, described in Chapter 1, must be applied to all muscular endurance and strength training. These principles are overload, progression, specificity, regularity, recovery, balance, and variety.

OVERLOAD

The overload principle is the basis for all exercise training programs. For a muscle to increase in strength, the workload to which it is subjected during exercise must be increased beyond what it normally experiences. In other words, the muscle must be overloaded. Muscles adapt to increased workloads by becoming larger and stronger and by developing greater endurance.

To understand the principle of overload, it is important to know the following strength-training terms:

- Full range of motion. To obtain optimal gains, the overload must be applied throughout the full range of motion. Exercise a joint and its associated muscles through its complete range starting from the pre-stretched position (stretched past the relaxed position) and ending in a fully contracted position. This is crucial to strength development.
- Repetition. When an exercise has progressed through one complete range of motion and back to the beginning, one repetition has been completed.
- One-repetition maximum (1-RM). This is a repetition performed against the greatest possible resistance (the maximum weight a person can lift one time). A 10-RM is the maximum weight one can lift correctly 10 times. Similarly, an 8-12 RM is that weight which allows a person to do from 8 to 12 correct repetitions. The intensity for muscular endurance and strength training is often expressed as a percentage of the 1-RM.

- Set. This is a series of repetitions done without rest.
- Muscle Failure. This is the inability of a person to do another correct repetition in a set.

The minimum resistance needed to obtain strength gains is 50 percent of the 1-RM. However, to achieve enough overload, programs are designed to require sets with 70 to 80 percent of one's 1-RM. (For example, if a soldier's 1-RM is 200 pounds, multiply 200 pounds by 70 percent [$200 \times 0.70 = 140$ pounds] to get 70 percent of the 1-RM.)

A better and easier method is the repetition maximum (RM) method. The exerciser finds and uses that weight which lets him do the correct number of repetitions. For example, to develop both muscle endurance and strength, a soldier should choose a weight for each exercise which lets him do 8 to 12 repetitions to muscle failure. (See Figure 3-1.) The weight should be heavy enough so that, after doing from 8 to 12 repetitions, he momentarily cannot correctly do another repetition. This weight is the 8-12 RM for that exercise.

MUSCULAR ENDURANCE/ STRENGTH DEVELOPMENT

To develop muscle strength, the weight selected should be heavier and the RM will also be different. For example, the soldier should find that weight for each exercise which lets him do 3 to 7 repetitions correctly. This weight is the 3-7 RM for that exercise. Although the greatest improvements seem to come from resistances of about 6-RM, an effective range is a 3-7 RM. The weight should be heavy enough so that an eighth repetition would be impossible because of muscle fatigue.

The weight should also not be too heavy. If one cannot do at least three repetitions of an exercise, the resistance is too great and should be reduced. Soldiers who are just beginning a resistance-training program should not start with heavy weights. They should first build an adequate foundation by training with an 8-12 RM or a 12+ RM.

To develop muscular endurance, the soldier should choose a resistance that lets him do more than 12 repetitions of a given

exercise. This is his 12+ repetition maximum (12+ RM). With continued training, the greater the number of repetitions per set, the greater will be the improvement in muscle endurance and the smaller the gains in strength. For example, when a soldier trains with a 25-RM weight, gains in muscular endurance will be greater than when using a 15-RM weight, but

the gain in strength will not be as great. To optimize a soldier's performance, his RM should be determined from an analysis of the critical tasks of his mission. However, most soldiers will benefit most from a resistance-training program with an 8-12 RM.

FITT Factors Applied to Conditioning Programs for Muscular Endurance and/or Strength		
Muscular Strength	Muscular Endurance	Muscular Strength and Muscular Endurance
3 times/week	3-5 time/week	3 times/week
3-7 RM*	12+ RM	8-12 RM
The time required to do 3-7 repetitions of each resistance exercise	The time required to do 12+ repetitions of each resistance exercise	The time required to do 8-12 repetitions of each resistance exercise
<p>Free Weights Resistance Machines Partner-Resisted Exercises Body-Weight Exercises (Push-ups/Sit-ups/Pull-ups/Dips, etc.)</p> <p>* RM = Repetition Maximum</p>		

Figure 3-1

Whichever RM range is selected, the soldier must always strive to over-load his muscles. The key to overloading a muscle is to make that muscle exercise harder than it normally does.

An overload may be achieved by any of the following methods:

- Increasing the resistance.
- Increasing the number of repetitions per set.
- Increasing the number of sets.
- Reducing the rest time between sets.
- Increasing the speed of movement in the concentric phase. (Good form is more important than the speed of movement.)
- Using any combination of the above.

PROGRESSION

When an overload is applied to a muscle, it adapts by becoming stronger and/or by improving its endurance. Usually significant increases in strength can be made in three to four weeks of proper training depending on the individual. If the workload is not progressively increased to keep pace with newly won strength, there will be no further gains. When a soldier can correctly do the upper limit of repetitions for the set without reaching muscle failure, it is usually time to increase the resistance. For most soldiers, this upper limit should be 12 repetitions.

For example, if his plan is to do 12 repetitions in the bench press, the soldier starts with a weight that causes muscle failure at

between 8 and 12 repetitions (8-12 RM). He should continue with that weight until he can do 12 repetitions correctly. He then should increase the weight by about 5 percent but no more than 10 percent. In a multi-set routine, if his goal is to do three sets of eight repetitions of an exercise, he starts with a weight that causes muscle failure before he completes the eighth repetition in one or more of the sets. He continues to work with that weight until he can complete all eight repetitions in each set, then increases the resistance by no more than 10 percent.

SPECIFICITY

A resistance-training program should provide resistance to the specific muscle groups that need to be strengthened. These groups can be identified by doing a simple assessment. The soldier slowly does work-related movements he wants to improve and, at the same time, he feels the muscles on each side of the joints where motion occurs. Those muscles that are contracting or becoming tense during the movement are the muscle groups involved. If the soldier's performance of a task is not adequate or if he wishes to improve, strength training for the identified muscle(s) will be beneficial. To improve his muscular endurance and strength in a given task, the soldier must do resistance movements that are as similar as possible to those of doing the task. In this way, he ensures maximum carryover value to his soldiering tasks.

REGULARITY

Exercise must be done regularly to produce a training effect. Sporadic exercise may do more harm than good. Soldiers can maintain a moderate level of strength by doing proper strength workouts only once a week, but three workouts per week are best for optimal gains. The principle of regularity also applies to the exercises for individual muscle groups. A soldier can work out three times a week, but when different muscle groups are exercised at each workout, the principle of regularity is violated and gains in strength are minimal.

RECOVERY

Consecutive days of hard resistance training for the same muscle group can be detrimental. The muscles must be allowed sufficient recovery time to adapt. Strength training can be done every day only if the exercised muscle groups are rotated, so that the same muscle or muscle group is not exercised on consecutive days. There should be at least a 48-hour recovery period between workouts for the same muscle groups. For example, the legs can be trained with weights on Monday, Wednesday, and Friday and the upper body muscles on Tuesday, Thursday, and Saturday.

Recovery is also important within a workout. The recovery time between different exercises and sets depends, in part, on the intensity of the workout. Normally, the recovery time between sets should be 30 to 180 seconds.

BALANCE

When developing a strength training program, it is important to include exercises that work all the major muscle groups in both the upper and lower body. One should not work just the upper body, thinking that running will strengthen the legs.

Most muscles are organized into opposing pairs. Activating one muscle results in a pulling motion, while activating the opposing muscle results in the opposite, or pushing, movement. When planning a training session, it is best to follow a pushing exercise with a pulling exercise which results in movement at the same joint(s). For example, follow an overhead press with a lat pull-down exercise. This technique helps ensure good strength balance between opposing muscle groups which may, in turn, reduce the risk of injury. Sequence the program to exercise the larger muscle groups first, then the smaller muscles. For example, the lat pull-down stresses both the larger latissimus dorsi muscle of the back and the smaller biceps muscles of the arm. If curls are done first, the smaller muscle group will be exhausted and too weak to handle the resistance needed for the lat pull-down. As a result, the soldier cannot do as many repetitions with as much weight as he

normally could in the lat pull-down. The latissimus dorsi muscles will not be overloaded and, as a result, they may not benefit very much from the workout.

The best sequence to follow for a total-body strength workout is to first exercise the muscles of the hips and legs, followed by the muscles of the upper back and chest, then the arms, abdominal, low back, and neck. As long as all muscle groups are exercised at the proper intensity, improvement will occur.

VARIETY

A major challenge for all fitness training programs is maintaining enthusiasm and

interest. A poorly designed strength-training program can be very boring. Using different equipment, changing the exercises, and altering the volume and intensity are good ways to add variety, and they may also produce better results. The soldier should periodically substitute different exercises for a given muscle group(s). For example, he can do squats with a barbell instead of leg presses on a weight machine. Also, for variety or due to necessity (for example, when in the field), he can switch to partner-resisted exercises or another form of resistance training. However, frequent wholesale changes should be avoided as soldiers may become frustrated if they do not have enough time to adapt or to see improvements in strength.

CHAPTER 4

Flexibility

Flexibility is a component of physical fitness. Developing and maintaining it are important parts of a fitness program. Good flexibility can help a soldier accomplish such physical tasks as lifting, loading, climbing, parachuting, running, and rappelling with greater efficiency and less risk of injury.

Flexibility is the range of movement of a joint or series of joints and their associated muscles. It involves the ability to move a part of the body through the full range of motion allowed by normal, disease-free joints.

No one test can measure total-body flexibility. However, field tests can be used to assess flexibility in the hamstring and low-back areas. These areas are commonly susceptible to injury due, in part, to loss of flexibility. A simple toe-touch test can be used. Soldiers should stand with their legs straight and feet together and bend forward slowly at the waist. A soldier who cannot touch his toes without bouncing or bobbing needs work to improve his flexibility in the muscle groups stretched by this test. The unit's Master Fitness Trainer can help him design a stretching program to improve his flexibility.

Stretching during the warm-up and cool-down helps soldiers maintain overall flexibility. Stretching should not be painful, but it should cause some discomfort because the muscles are being stretched beyond their normal length. Because people differ somewhat anatomically, comparing one person's flexibility with another's should not be done. People with poor flexibility who try to stretch as far as others may injure themselves.

STRETCHING TECHNIQUES

Using good stretching techniques can improve flexibility. There are four commonly recognized categories of stretching techniques: static, passive, proprioceptive neuromuscular facilitation (PNF), and ballistic. These are described here and shown later in this chapter.

Static Stretching

Static stretching involves the gradual lengthening of muscles and tendons as a body part moves around a joint. It is a safe and effective method for improving flexibility. The soldier assumes each stretching position slowly until he feels tension or tightness. This lengthens the muscles without causing a reflex contraction in the stretched muscles. He should hold each stretch for ten seconds or longer. This lets the lengthened muscles adjust to the stretch without causing injury.

The longer a stretch is held, the easier it is for the muscle to adapt to that length. Static stretching should not be painful. The soldier should feel slight discomfort, but no pain. When pain results from stretching, it is a signal that he is stretching a muscle or tendon too much and may be causing damage.

Passive Stretching

Passive stretching involves the soldier's use of a partner or equipment, such as a towel, pole, or rubber tubing, to help him stretch. This produces a safe stretch through a range of motion he could not achieve without help. He should talk with his partner to ensure that each muscle is stretched safely through the entire range of motion.

PNF stretching

PNF stretching uses the neuromuscular patterns of each muscle group to help improve flexibility. The soldier performs a series of intense contractions and relaxations using a partner or equipment to help him stretch. The PNF technique allows for greater muscle relaxation following each contraction and increases the soldier's ability to stretch through a greater range of motion.

Ballistic Stretching

Ballistic, or dynamic, stretching involves movements such as bouncing or bobbing to attain a greater range of motion and stretch. Although this method may improve flexibility, it often forces a muscle to stretch too far and may result in an injury. Individuals and units should not use ballistic stretching.

FITT Factors

Commanders should include stretching exercises in all physical fitness programs.

The following FITT factors apply when developing a flexibility program.

- Frequency: Do flexibility exercises daily. Do them during the warm-up to help prepare the muscles for vigorous activity and to help reduce injury. Do them during the cool-down to help maintain flexibility.
- Intensity: Stretch a muscle beyond its normal length to the point of tension or slight discomfort, not pain.
- Time: Hold stretches for 10 to 15 seconds for warming up and cooling down and for 30 seconds or longer to improve flexibility.
- Type: Use static stretches, assumed slowly and gradually, as well as passive stretching and/or PNF stretching.

Warm-Up and Cool-Down

The warm-up and cool-down are very important parts of a physical training session, and stretching exercises should be a major part of both.

THE WARM-UP

Before beginning any vigorous physical activity, one should prepare the body for exercise. The warm-up increases the flow of blood to the muscles and tendons, thus helping reduce the risk of injury. It also increases the joint's range of motion and positively affects the speed of muscular contraction.

A recommended sequence of warm-up activities follows. Soldiers should do these for five to seven minutes before vigorous exercise.

- Slow jogging-in-place or walking for one to two minutes. This causes a gradual increase in the heart rate, blood pressure, circulation, and increases the temperature of the active muscles.
- Slow joint rotation exercises (for example, arm circles, knee/ankle rotations) to gradually increase the joint's range of motion. Work each major joint for 5 to 10 seconds.

- Slow, static stretching of the muscles to be used during the upcoming activity. This will "loosen up" muscles and tendons so they can achieve greater ranges of motion with less risk of injury. Hold each stretch position for 10 to 15 seconds, and do not bounce or bob.
- Calisthenic exercise, as described in Chapter 7, to increase the intensity level before the activity or conditioning period.
- Slowly mimic the activities to be performed. For example, lift a lighter weight to warm-up before lifting a heavier one. This helps prepare the neuromuscular pathways.

THE COOL-DOWN

The cool-down helps the soldier taper off gradually before stopping completely.

The following information explains the importance of cooling down and how to do it correctly.

- Do not stop suddenly after vigorous exercise, as this can be very dangerous. Gradually bring the body back to its resting state by slowly decreasing the intensity of the activity. After running, for example, one should walk for one to two minutes. Stopping exercise suddenly can cause blood to pool in the muscles, thereby reducing blood flow to the heart and brain. This may cause fainting or abnormal rhythms in the heart which could lead to serious complications.
- Repeat the stretches done in the warm-up to help ease muscle tension and any immediate feeling of muscle soreness. Be careful not to overstretch. The muscles are warm from activity and can possibly be overstretched to the point of injury.
- Hold stretches 30 seconds or more during the cool-down to improve flexibility. Use partner-assisted or PNF techniques, if possible.

The soldier should not limit flexibility training to just the warm-up and cool-down periods. He should sometimes use an entire PT session on a "recovery" or "easy" training day to work on flexibility improvement. He may also work on it at home. Stretching is one form of

exercise that takes very little time relative to the benefits gained.

Rotation Exercises

Rotation exercises are used to gently stretch the tendons, ligaments, and muscles associated with a joint and to stimulate lubrication of the joint with synovial fluid. This may provide better movement and less friction in the joint.

STATIC STRETCHES

Assume all stretching positions slowly until you feel tension or slight discomfort. Hold each position for at least 10 to 15 seconds during the warm-up and cool-down. Developmental stretching to improve flexibility requires holding each stretch for 30 seconds or longer. Choose the appropriate stretch for the muscles groups which you will be working.

PASSIVE STRETCHES

Passive Stretching is done with the help of a partner or equipment. The examples in this chapter show passive stretching done with a towel or with a partner. When stretching alone, using a towel may help the exerciser achieve a greater range of motion.

CHAPTER 5

Body Composition

Body composition, which refers to the body's relative amounts of fat and lean body mass (organs, bones, muscles), is one of the five components of physical fitness. Good body composition is best gained through proper diet and exercise. Examples of poor body composition are underdeveloped musculature or excessive body fat. Being overweight (that is, overly fat) is the more common problem.

Poor body composition causes problems for the Army. Soldiers with inadequate muscle development cannot perform as well as soldiers with good body composition. As a soldier gets fat, his ability to perform physically declines, and his risk of developing disease increases. Soldiers with high percentages of body fat often have lower APFT scores than those with lower percentages. Poor body composition, especially obesity, has a negative effect on appearance, self-esteem, and negatively influences attitude and morale.

The Army's weight control program is described in AR 600-9. It addresses body composition standards, programs for the overly fat, and related administrative actions.

The amount of fat on the body, when expressed as a percentage of total body weight, is referred to as the percent body fat. The Army's maximum allowable percentages of body fat, by age and sex, are listed in Figure 5-1.

Evaluation Methods

The Army determines body fat percentage using the girth method. (This is described in AR 600-9, pages 12-21.)

Body composition is influenced by age, diet, fitness level, and genetic factors (gender and body type). The Army's screening charts for height and weight (shown in AR 600-9) make allowances for these differences. A soldier whose weight exceeds the standard weight shown on the charts may not necessarily be overfat. For example, some well-muscled athletes have body weights that far exceed the values for weight listed on the charts for their

age, gender, and height. Yet, only a small percentage of their total body mass may be fat. In such cases, the lean body mass accounts for a large share of their total body composition, while only a small percentage of the total body mass is composed of fat.

Soldiers who do not meet the weight standards for their height and/or soldiers whose appearance suggests that they have excessive fat are to be evaluated using the circumference (girth measurement) method described in AR 600-9.

A more accurate way to determine body composition is by hydrostatic or underwater weighing. However, this method is very time-consuming and expensive and usually done only at hospitals and universities.

Soldiers who do not meet Army body fat standards are placed on formal, supervised weight (fat) loss programs as stipulated in AR 600-9. Such programs include sensible diet and exercise regimens.

Diet and Exercise

A combination of exercise and diet is the best way to lose excessive body fat. Losing one to two pounds a week is a realistic goal which is best accomplished by reducing caloric intake and increasing energy expenditure. In other words, one should eat less and exercise more. Dieting alone can cause the body to believe it is being starved. In response, it tries to conserve its fat reserves by slowing down its metabolic rate and, as a result, it loses fat at a slower rate.

BODY FAT STANDARDS				
AGES	17-20	21-27	28-39	40+
MALES 20%	20%	22%	24%	26%
FEMALES	30%	32%	34%	36%

Figure 5-1

Soldiers must consume a minimum number of calories from all the major food groups, with the calories distributed over all the daily meals including snacks. This ensures an adequate consumption of necessary vitamins and

minerals. A male soldier who is not under medical supervision when dieting requires a caloric intake of at least 1,500; women require at least 1,200 calories. Soldiers should avoid diets that fail to meet these criteria.

Trying to lose weight with fad diets and devices or by skipping meals does not work for long-term fat loss, since weight lost through these practices is mostly water and lean muscle tissue, not fat. Losing fat safely takes time and patience. There is no quick and easy way to improve body composition.

The soldier who diets and does not exercise loses not only fat but muscle tissue as well. This can negatively affect his physical readiness. Not only does exercise burn calories, it helps the body maintain its useful muscle mass, and it may also help keep the body's metabolic rate high during dieting.

Fat can only be burned during exercise if oxygen is used. Aerobic exercise, which uses lots of oxygen, is the best type of activity for burning fat. Aerobic exercises include jogging, walking, swimming, bicycling, cross-country skiing, rowing, stair climbing, exercise to music, and jumping rope. Anaerobic activities, such as sprinting or lifting heavy weights, burn little, if any, fat.

Exercise alone is not the best way to lose body fat, especially in large amounts. For an average-sized person, running or walking one mile burns about 100 calories. Because there are 3,500 calories in one pound of fat, he needs to run or walk 35 miles if pure fat were being burned. In reality, fat is seldom the only source of energy used during aerobic exercise. Instead, a mixture of both fats and carbohydrates is used. As a result, most people would need to run or walk over 50 miles to burn one pound of fat.

A combination of proper diet and aerobic exercise is the proven way to lose excessive body fat. Local dietitians and nutritionists can help soldiers who want to lose weight by suggesting safe and sensible diet programs. In addition, the unit's MFT can design tailored exercise programs which will help soldiers increase their caloric expenditure and maintain their lean body mass.

CHAPTER 10

Developing the Program

The goal of the Army's physical fitness program is to improve each soldier's physical ability so he can survive and win on the battlefield. Physical fitness includes all aspects of physical performance, not just performance on the APFT. Leaders must understand the principles of exercise, the FITT factors, and know how to apply them in order to develop a sound PT program that will improve all the fitness components. To plan PT successfully, the commander and MFT must know the training management system. (See FM 25-100.)

Commanders should not be satisfied with merely meeting the minimum requirements for physical training which is having all of their soldiers pass the APFT. They must develop programs that train soldiers to maximize their physical performance. Leaders should use incentives. More importantly, they must set the example through their own participation.

Commanders must develop programs that train soldiers to maximize their physical performance.

The unit PT program is the commander's program. It must reflect his goals and be based on sound, scientific principles. The wise commander also uses his PT program as a basis for building team spirit and for enhancing other training activities. Tough, realistic training is good. However, leaders must be aware of the risks involved with physical training and related activities. They should, therefore, plan wisely to minimize injuries and accidents.

Steps in Planning

STEP 1: ANALYZE THE MISSION

When planning a physical fitness program, the commander must consider the type of unit and its mission. Missions vary as do the physical requirements necessary to complete them. As stated in FM 7-0, "The wartime mission drives training." A careful analysis of the mission, coupled with the commander's intent, yields the mission-essential task list (METL) a unit must perform.

Regardless of the unit's size or mission,

reasonable goals are essential. According to FM 7-0, the goals should provide a common direction for all the commander's programs and systems. An example of a goal is as follows because the exceptional physical fitness of the soldier is a critical combat-multiplier in the division, it must be our goal to ensure that our soldiers are capable of roadmarching 12 miles with a 50-pound load in less than three hours.

STEP 2: DEVELOP FITNESS OBJECTIVES

Objectives direct the unit's efforts by prescribing specific actions. The commander, as tactician, and the MFT, as physical fitness advisor, must analyze the METL and equate this to specific fitness objectives. Examples of fitness objectives are the following:

- Improve the unit's overall level of strength by ensuring that all soldiers in the unit can correctly perform at least one repetition with 50 percent of their bodyweight on the overhead press using a barbell.
- Improve the unit's average APFT score through each soldier obtaining a minimum score of 80 points on the push-up and sit-up events and 70 points on the 2-mile run.
- Decrease the number of physical training injuries by 25 percent through properly conducted training.

The commander and MFT identify and prioritize the objectives.

STEP 3: ASSESS THE UNIT

With the training objectives established, the commander and MFT are ready to find the unit's current fitness level and measure it against the desired level.

Giving a diagnostic APFT is one way to find the current level. Another way is to have the soldiers road march a certain distance within a set time while carrying a specified load. Any quantifiable, physically demanding, mission-essential task can be used as an assessment tool. Training records and reports, as well as any previous ARTEP, EDREs, and so forth, can also provide invaluable information.

STEP 4: DETERMINE TRAINING REQUIREMENTS

By assessing the unit's fitness capabilities and comparing them to the standards defined in training objectives, leaders can determine fitness training requirements. When, after extensive training, soldiers cannot reach the desired levels of fitness, training requirements may be too idealistic. Once training requirements are determined, the commander reviews higher headquarters' long- and short-range training plans to identify training events and allocation of resources which will affect near-term planning.

STEP 5: DEVELOP FITNESS TASKS

Fitness tasks provide the framework for accomplishing all training requirements. They identify what has to be done to correct all deficiencies and sustain all proficiencies. Fitness tasks establish priorities, frequencies, and the sequence for training requirements. They must be adjusted for real world constraints before they become a part of the training plan. The essential elements of fitness tasks can be cataloged into four groups:

- (1) Collective tasks
- (2) Individual tasks
- (3) Leader tasks
- (4) Resources required for training

Collective tasks. Collective tasks are the training activities performed by the unit. They are keyed to the unit's specific fitness objectives. An example would be to conduct training to develop strength and muscular endurance utilizing a sandbag circuit.

Individual tasks. Individual tasks are activities that an individual soldier must do to accomplish the collective training task. For example, to improve CR endurance the individual soldier must do ability-group running, road marching, Fartlek training, interval training, and calculate/monitor his THR when appropriate.

Leader tasks. Leader tasks are the specific tasks leaders must do in order for collective and individual training to take place. These will involve procuring resources, the setting up of training, education of individual soldiers, and the supervision of the actual training.

Resources. Identifying the necessary equipment, facilities, and training aids during the planning

phase gives the trainer ample time to prepare for the training. The early identification and acquisition of resources is necessary to fully implement the training program. The bottom line is that training programs must be developed using resources which are available.

STEP 6: DEVELOP A TRAINING SCHEDULE

The fitness training schedule results from leaders' near-term planning. Leaders must emphasize the development of all the fitness components and follow the principles of exercise and the FITT factors. The training schedule shows the order, intensity, and duration of activities for PT. Figure 10-1 illustrates a typical PT session and its component parts.

There are three distinct steps in planning a unit's daily physical training activities. They are as follows:

1. Determine the minimum frequency of training. Ideally, it should include three cardiorespiratory and three muscular conditioning sessions each week. (See the FITT factors in Chapter 1.)
2. Determine the type of activity. This depends on the specific purpose of the training session. (See Figure 10-2.) For more information on this topic, see Chapters 1, 2, and 3.
3. Determine the intensity and time of the selected activity. (See the FITT factors in Chapter 1.)

Each activity period should include a warm-up, a workout that develops cardiorespiratory fitness and/or muscular endurance and strength, and a cool-down. (See Figure 10-1.)

At the end of a well-planned and executed PT session, all soldiers should feel that they have been physically stressed. They should also understand the objective of the training session and how it will help them improve their fitness levels.

STEP 7: CONDUCT AND EVALUATE TRAINING

The Commander and MFT now begin managing and supervising the day-to-day training. They evaluate how the training is performed by monitoring its intensity, using

THR or muscle failure, along with the duration of the daily workout.

The key to evaluating training is to determine if the training being conducted will result in improvements in physical conditioning. If not, the training needs revision. Leaders should not be side tracked by PT that is all form and little substance. Such training defeats the concept of objective-based training and results in little benefit to soldiers.

Education

Teaching soldiers about physical fitness is vital. It must be an ongoing effort that uses trained experts like MFTs. Soldiers must

understand why the program is organized the way it is and what the basic fitness principles are. When they know why they are training in a certain way, they are more likely to wholeheartedly take part. This makes the training more effective.

Education also helps the Army develop its total fitness concept. Total fitness should be reinforced throughout each soldier's career. Classroom instruction in subjects such as principles of exercise, diet and nutrition, tobacco cessation, and stress management should be held at regular intervals. Local "Fit To Win" coordinators (AR 600-63) can help develop classes on such subjects.

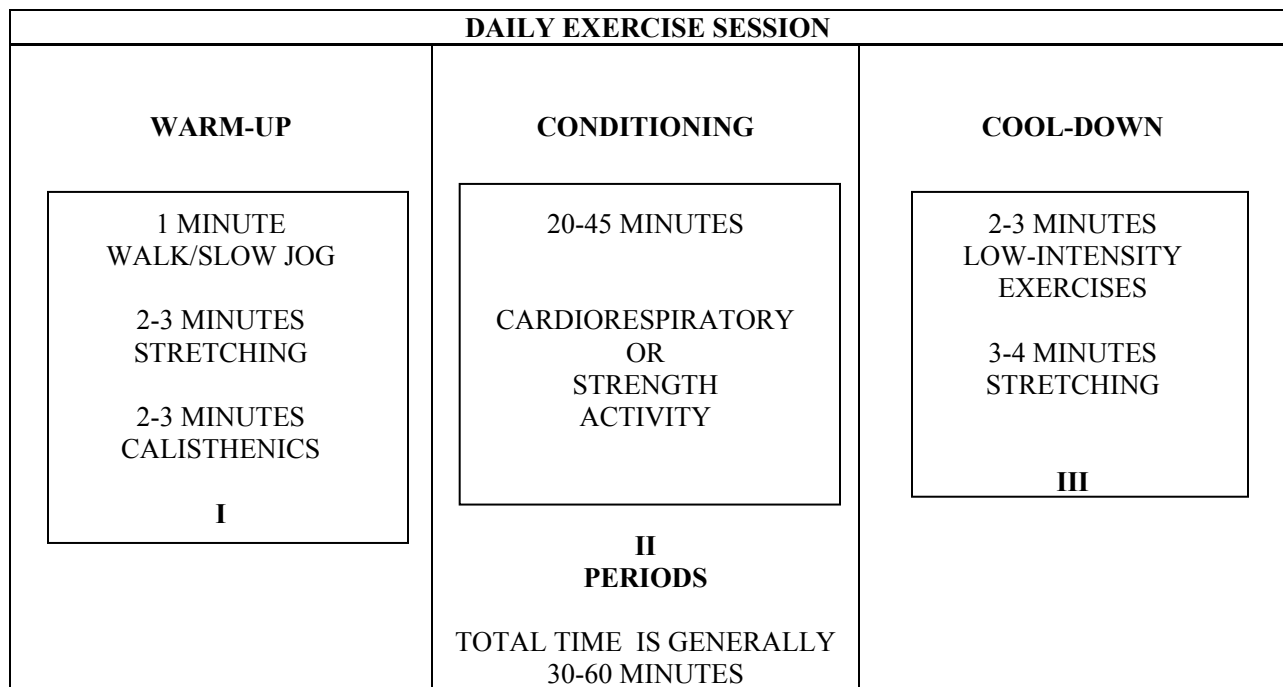


Figure 10-1

Activity Selection Guide

PURPOSE	MUSCULAR STRENGTH	MUSCULAR ENDURANCE	CARDIO- RESPIRATORY ENDURANCE	FLEXI- BILITY	BODY COMPO- SITION	SPEED/ AGILITY	COORDI- NATION	TEAM/ WORK	SOLDIER SKILLS
Aerobics		X	X	X	X		X		
Bicycling		X	X		X				
Circuits	X	X	X	X	X	X	X	X	X
Competitive Activities						X	X	X	X
Calisthenics		X		X		X	X		
Cross Country Skiing	X	X	X	X	X		X		
Grass/Guerri- lla Drills	X	X	X		X		X		
Obstacle Courses	X	X	X		X	X	X	X	X
Partner- Resisted Exercises	X	X					X	X	
Relays		X	X		X	X	X	X	
Rifle Drills	X	X					X		X
Road Marching	X	X	X		X				X
Running		X	X		X				
Stretching				X					
Weight Training	X	X				X	X		

Figure 10-2

Common Errors

There are some common errors in unit programs. The most common error concerns the use of unit runs. When all soldiers must run at the same pace as with a unit run, many do not reach their training heart rate (THR). The least-fit soldiers of the unit may be at risk because they may be training at heart rates above their THR. Another error is exclusively using activities such as the “daily dozen.” These exercises emphasize form over substance and do little to improve fitness.

Yet another error is failing to strike a balance in a PT program between CR endurance training and muscular endurance and strength training. In addition, imbalances often stem from a lack of variety in the program which leads to boredom. The principles of exercise are described in Chapter

1, and their application is shown in the sample program below.

A Sample Program

The following sample program shows a commander’s thought processes as he develops a 12-week fitness training program for his unit.

Captain Frank Jones’s company has just returned from the field where it completed an ARTEP. Several injuries occurred including a broken foot, resulting from a dropped container, and three low back strained. After evaluating his unit during this ARTEP, CPT Jones concluded that its level of physical fitness was inadequate. He thought this contributed to the injuries and poor performance. The soldier’s flexibility was poor, and there was an apparent lack of prior emphasis on, and training in, good lifting, techniques. This,

combined with poor flexibility in the low back and hamstrings, may have contributed to the unacceptably high number of low back strains. Captain Jones decided to ask the battalion's MFT to help him develop a good unit program for the company. They went through the following steps:

7-STEP PLANNING PROCESS

ANALYZE THE MISSION
DEVELOP FITNESS OBJECTIVES
ASSESS THE UNIT
DETERMINE TRAINING REQUIREMENTS
DESIGN FITNESS TASKS
DEVELOP A TRAINING SCHEDULE
CONDUCT AND EVALUATE TRAINING

ANALYZE THE MISSION

First, they analyzed the recently completed ARTEP and reviewed the ARTEP manual to find the most physically demanding, mission-oriented tasks the unit performs. The analysis showed that, typically, the company does a tactical road march and then occupies a position. It establishes a perimeter, improves its position, and selects and prepares alternate positions. One of the most demanding missions while in position requires soldiers to move by hand, for 15 to 30 minutes, equipment weighing up to 90 pounds. If his unit received artillery fire, it would need to be able to move to alternate positions as quickly as possible. This requires much lifting, digging, loading, Unloading-loading, and moving of heavy equipment. All of these tasks require good muscular endurance and strength and a reasonable level of cardiorespiratory endurance.

DEVELOP FITNESS OBJECTIVES

Next CPT Jones reviewed his battalion commander's physical training guidance. It showed that the commander was aware that the unit's tasks require muscular endurance and strength and cardiorespiratory fitness. The guidance and objectives issued are as follows:

a. Units will do PT five days a week (0600-0700) when in garrison. In the field, organized PT will be at the commander's discretion.

Captain Jones determined that the major PT emphasis should be to improve muscular endurance and strength. He based this on his unit's mission, training schedule, available

resources, and on his commander's guidance and objectives. With this information and the MFTs recommendations, CPT Jones developed the following fitness objectives,

- Improve the unit's overall level of muscular endurance and strength.
- Improve the unit's overall level of flexibility.
- Improve the unit's average APFT score. Each soldier will score at least 80 points on the push-up and sit-up events and 70 points on the 2-mile run.
- Improve the unit's road marching capability so that 100 percent of the unit can complete a 12-mile road march with a 35 pound load in at least 3.5 hours.
- Reduce tobacco use.

ASSESS THE UNIT

The next step CPT Jones accomplished was to assess his unit.

The MFT studied the results of the unit's latest APFT and came up with the following information.:

- The average push-up score was 68 points.
- The average sit-up score was 72 points.
- The average number points scored on the 2-mile run was 74.
- There were six failures, two on the 2-mile run and four on the push-up.

The MFT also recommended that the unit be assessed in the following areas: road march performance, strength, flexibility, substance abuse, and profiled soldiers.

Following the MFT's recommendations, subordinate leaders made the following assessments/determinations:

- Eighty-eight percent of the company finished the 12-mile road march with a 35-pound load in under 3 hours 30 minutes.
- A formation toe-touch test revealed that over half the company could not touch their toes while their knees were extended.
- Thirty percent of the unit uses tobacco.
- Two soldiers are in the overweight program.
- Eight percent of the unit is now on temporary profile, most from back problems.

DETERMINE TRAINING REQUIREMENTS

The next step CPT Jones accomplished was to determine the training requirements.

Training requirements are determined by analyzing the training results and the data obtained from the unit assessment. The next step is to compare this data to the standards identified in the training objectives. When performance is less than the established standard, the problem must be addressed and corrected.

Captain Jones established the following training requirements.

Units will do flexibility exercises during the warm-up and cool-down phase of every PT session. During the cool-down, emphasis will be placed on developing flexibility in the low back, hamstrings, and hip extensor muscle groups.

Each soldier will do 8 to 12 repetitions of bent-leg, sandbag dead-lifts at least two times a week to develop strength. The section leader will supervise lifts.

Each soldier will do heavy resistance/weight training for all the muscle groups of the body two to three times a week.

Each soldier will perform timed sets of push-ups and sit-ups.

Each soldier will train at least 20 to 30 minutes at THR two to three times a week.

Road marches will be conducted at least once every other week.

Tobacco cessation classes will be established to reduce the number of tobacco users.

DESIGN FITNESS TASKS

Once all training requirements are identified, the next step is to use them to design fitness tasks which relate to the fitness objectives. In developing the fitness tasks, CPT Jones must address collective, individual, and leader tasks as well as resources required.

Fitness tasks provide the framework for accomplishing the training requirements. By accurately listing the fitness tasks that must be done and the resources required to do them, the subsequent step of developing a training schedule is greatly facilitated.

An example of designing fitness tasks is provided in Figure 10-3 by using the activities which might occur during one week of physical training.

The collective tasks all soldiers must perform during the week are as follows. For developing strength and muscular endurance, they must perform appropriate strength circuit exercises, PREs, sandbag circuits, to include performing bent-leg dead lift exercises, and training for push-up/sit-up improvement. To improve cardiorespiratory endurance, they must do ability-group runs, interval training, road marching, and they must calculate their THR and monitor their daily warm-up and cool-down.

The leader's tasks are to organize and supervise all strength-and muscle endurance-training sessions and CR training sessions so as to best meet all related fitness objectives for the development and maintenance of flexibility.

To provide specific examples of leader tasks in the area of training for strength and muscle endurance, the leader will ensure the following:

- Each strength-and/or muscle endurance-training session works all the major muscle groups of the body.
- High priority is given to training those muscles and muscle groups used in mission-essential tasks.
- Areas where weaknesses exist, with respect to strength/muscle endurance, are targeted in all workouts,
- Problem areas related to APFT performance are addressed in appropriate workshops.

FITNESS TASKS FOR ONE WEEK OF PHYSICAL TRAINING			
COLLECTIVE	INDIVIDUAL	LEADER	RESOURCES
Improve strength and muscle endurance	Do STR CIR EX*, PRE, SNDBG CIR	Organize & supervise STR CIR EX, PRE, & SNDBG CIR	STR RM, Gym Sandbags, PT Field
Improve CR endurance	Do AGR, CAL, MON THR, road march, do intervals (4X440) IND AB	Organize & supervise CR workouts, CAL/MON THR, MON work/relief ratio for intervals	Track, Running Trails
Improve flexibility	Do stretching exercises	Organize & supervise activity	GYM
* A list of abbreviations appears at the end of Figure 10-4.			

Figure 10-3

The duration of each strength training session is 20-40 minutes.

- Soldiers train to muscle failure.
- All the principles of exercise, to include regularity, overload, recovery, progression, specificity, and balance are used.

In a similar manner, the leader would ensure that the guidelines and principles outlined in this and earlier chapters are used to organize training sessions for improving CR endurance and flexibility.

The resources needed for the one-week period are as follows: a strength room, a gym, a PT field, a running track, and/or running trails, and sandbags.

DEVELOP A TRAINING SCHEDULE

The next step was to develop a fitness training schedule (shown at Figure 10-4). It lists the daily activities and their intensity and duration.

12-WEEK TRAINING PLAN				
JULY				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
START ASSESSMENT* ACT: AGR** INT: 70% HRR*** DUR: 20 MIN ACT: PLT 1 & 2 WT STR CIR: PLT 3 & 4 SNDBG CIR/PU-SU IMP INT: MF DUR: 30-35/4 MIN ACT: FIXED CIR 1 INT: 70% HRR DUR: 30-4- MIN ACT: PLT 1 & 2 STR CIR: PLT 3 & 4 SNDBG CIR/PU-SU IMP INT: MF DUR: 30-40/5 MIN	FINISH ASSESSMENT ACT: PLT 1 & 2 STR CIR; PLT 3 & 4 SNDBG CIR/PU-SU IMP INT: MF/MF DUR: 30/4 MIN ACT: AGR/ PAR COURSE INT: 70% HRR DUR: 20/15-20 MIN ACT: PRE/PU-SU IMP INT: MF DUR: 40/5 MIN ACT: AGR INT: 70% HRR DUR: 25 MIN	ACT: AGR/LINE SOCCOR INT: 70% HRR DUR: 35/4 MIN FLIP - FLOP MONDAY'S WORKOUT ACT: AGR/GDR INT: 70% HRR DUR: 22/20 MIN FLIP - FLOP MONDAY'S WORKOUT	ACT: PRE/PU/SU IMP INT: MF DUR: 35/4 MIN ACT: AGR/GDR INT: 70% HRR DUR: 20/15-20 MIN ACT: SNDBG CIR/PU-SU IMP INT: MF DUR: 35-40/5 MIN ACT: AGR INT: 70% HRR DUR: 25 MIN	ACT: ROAD MARCH, 5 MLE W 35 LBS IN 90 MIN ACT: PRE/PU-SU IMP INT: M-F DUR: 35/4 MIN ACT: ROAD MARCH, 5 MLE W 35 LBS IN 90 MIN ACT: OBS CRS/PRE/PU-SU IMP INT: MF DUR: 25/20/5 MIN
<p>* Initially, assessments must be made of each soldier's level of physical fitness. Particularly important is assessing a soldier's strength and muscular endurance by determining his 8-12 RM for each resistance exercise he will be doing. As mentioned in the Phases of Conditioning section in Chapter 3, this will take two weeks and should be planned for accordingly. The other components of fitness should also be addressed as the need arises.</p> <p>** A list of abbreviations and acronyms appears at the end of this training plan.</p> <p>*** Those soldiers with a fairly good level of CR fitness (that is, the average soldier) should exercise at about 70 percent HRR. Those with very high levels of fitness may benefit most from training at around 80 to 85 percent HRR during a CR training workout.</p>				

Figure 10-4

12-WEEK TRAINING PLAN				
AUGUST				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
ACT: AGR INT: 70%HRR DUR: 27 MIN	ACT: PLT 1 & 2 SNDBG CIR PLT 3 & 4 PRE/UP-SU IMP INT: MF DUR: 40/6	ACT: INTERVALS INT: 8 X 440 IND: AB DUR: 45 MIN	FLIP - FLOP TUESDAY'S WORKOUT	ACT: ROAD MARCH, 7.5 W 35 LBS IN 2.5 HRS
ACT: PLT 1 & 2 SNDBG CIR; PLT 3 & 4 STR CIR/PU-SU IMP INT: MF DUR: 40/6 MIN	ACT: LAST MAN- UP RUN IN AG/PAR CRS INT: 70-80% HRR*/70% HRR DUR: 30/20 MIN	FLIP - FLOP MONDAY'S WORKOUT	ACT: AGR/FITNESS RELAYS INT: 70% HRR/NA DUR: 30/20 MIN	ACT: PLT 1 & 2 SNDBG CIR: PLT 3 & 4 PRE/PU-SU IMP INT: MF DUR: 40/6 MIN
IN FIELD: PLAN FOR	IN FIELD: PLAN FOR	IN FIELD: PLAN FOR	IN FIELD: PLAN FOR	IN FIELD: PLAN FOR
ACT: LAST MAN -UP RUN IN AG INT: 70-90% HRR* DUR: 32MIN	ACT: PRE/PU-SU IMP INT: MF DUR: 40/5 MIN	ACT: FARTLEK IN AG INT: 60-90% HRR* DUR: 32 MIN	ACT: PU-SU, PULL-UP IMP INT: MF DUR: 40/8 MIN	ACT: ROAD MARCH, 10 MLE W 35 LBS IN 3.5 HOURS
ACT: PRE/PU-SU IMP INT: MF DUR: 35/10 MIN	ACT: INTERVALS INT: 8 X 440 IND AB DUR: 45 MIN	ACT: PU-SU, PULL-UP IMP INT: MF DUR: 45 MIN	ACT: FARTLEK IN AG INT: 60-90% HRR* DUR: 35 MIN	ACT: PU-SU, PULL-UP IMP INT: MF DUR: 45 MIN LC: APFT FOR GRADERS
<p>* During the Last-Man-Up and Fartlek running, the heart rate will vary depending on whether it is taken during the slower or the faster portion of the run. The smaller and larger numbers provided for percent HRR should set the lower and upper limits, respectively, for a soldier's heart rate during this type of training. During interval running, the soldier should concern himself with running at the appropriate pace; he should not monitor THR during interval work.</p>				

Figure 10-4 (continued)

12-WEEK TRAINING PLAN				
SEPTEMBER				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
ACT:DEVELMEN T-AL STRETCHING INT: SLIGHT TENSION, NOT PAIN DUR: 20-30 MIN	ACT: APFT DUR: NA	ACT: UNIT OLYMPICS, PART 1 DUR: NA	ACT: UNIT OLYMPICS, PART II DUR: N/A	ACT: APFT & OLYMPIC AWARDS CEREMONY/UNI T RUN INT: NA/CD DUR: NA/30-40 MIN
ACT: PLT 1 & 2 STR CIR; PLT 3 & 4 PRE INT: MF DUR: 40 MIN	ACT: PLT 1 & 2 AGR: PLT 3 & 4 EX TO MUSIC INT: 70% HRR DUR: 35/45 MIN	FLIP - FLOP MONDAY'S WORKOUT	ACT: ROAD MARCH, 10 MLE W 35 LBS IN 3 HOURS	ACT: PLT 1 & 2 SNDBG CIR: PLT 3 & 4 PRE INT:: MF DUR: 40 MIN
ACT: AGR INT: 70% HRR DUR: 35 MIN	ACT: PRE/PU-SU IMP INT: MF DUR: 40/8 MIN	ACT: FIXED CIRCUIT/RELAY S INT: 70% HRR/NA DUR: 20/20 MIN	ACT: UPPER BODY PRE/PU-SU IMP INT: MF DUR: 30/8 MIN	ACT: ROAD MARCH, 12 MLE W 35 LBS IN UNDER 4 HOURS
ACT: PLT 1 & 2 LOG DRILLS; PLT 3 & 4 SNDBG CIR/PU- SU IMP INT: MF DUR: 30/8 MIN	ACT: PLT 1 & 2 FIXED CIR; PLT 3 & 4 AQUATICS INT: 70% HRR/NA DUR: 30 MIN	FLIP-FLOP MONDAY'S WORKOUT	FLIP - FLOP TUESDAY'S WORKOUT	ACT: PRE /PU-SU, IMP INT: MF DUR: 35/8 MIN
<p>1. Push-ups and sit-ups are done as part of each strength workout. In the above sessions, they have been placed near the end of the workout. However, they can occasionally be done before the strength workout for variety. An example of a beginning PU-SU improvement workout lasting about three minutes follows:</p> <ol style="list-style-type: none"> Perform one timed set of push-ups for 50 seconds. Follow this immediately with one 50-second, timed set of sit-ups. For all timed sets, each soldier must perform as many repetitions of the exercise as he can during the allotted time period. Perform a second set of push-ups for 40 seconds. Follow this immediately with a timed set of sit-ups of equal duration. <p>As the soldier adapts to this, the difficulty of the session can be increased by adding more timed sets and/or by decreasing the rest interval between like or unlike sets of exercises. For example, the rest period between timed sets of push-ups and sit-ups can be decreased. Also, all of the timed sets for push-ups may be done back-to-back (as can the sit-ups), the rest interval between these timed sets of push-ups can be progressively reduced to make the workout more demanding. Many more options exist for increasing the difficulty of, and adding variety to, these sessions.</p> <p>2. Activities are planned for the FTX; duration is determined n site.</p> <p>3. The unit's Olympic events include the following:</p> <ol style="list-style-type: none"> Ammo-box shuttle-run (fastest time by section). Biceps, barbell curl (most reps with 60 lbs., total by section). Leg press (most weight lifted by section). Standing-toe touch (most soldiers touching toes by section/must hold five seconds). Highest APFT score by section. 				

Figure 10-4 (continued)

ABBREVIATIONS AND ACRONYMS	
ACT	activity
AG	ability groups
AGR	ability group run
ANA ACT	anaerobic activity
AOTR	assessment of training requirements
CAL/MON	calculate/monitor
CD	commander's decision
CFA	competitive fitness activities
CIR	circuit
CR	cardiorespiratory training
DL	dead-lift
EX	exercise
GDR	grass drills
GUD	guerrilla drills
HRR	heart rate reserve
IMP	improvement
IND AB	at the individual's ability
INT	intensity
LBS	pounds
LC	leader's class
MIN	minute(s)
MF	muscle failure (due to fatigue)
MLE	mile(s)
MS/E	muscle strength/endurance
NA	not applicable
OBS CRS	obstacle course
PLT	platoon
PRE	partner-resisted exercise(s)
PT FLD	physical training field
PU-SU IMP	push-up, sit-up improvement
R	run
SNDBG	sandbag
STR CIR EX	strength circuit exercise
STR RM	strength room
THR	training heart rate
TNG	training
W	with
WT STR CIR	strength circuit with weights
% HRR	percent of heart rate reserve
2-MR	2-mile run

Figure 10-4 (continued)

Conduct and Evaluate Training

Conducting and evaluating training is the final phase of the training process. This phase includes the evaluation of performance, assessment of capabilities, and feedback portions of the training management cycle. These portions of the cycle must be simultaneous and continuous. To be effective, the evaluation process must address why weaknesses exist, and it must identify corrective actions to be taken. Evaluations should address the following:

- Assessment of proficiency in mission-essential tasks.
- Status of training goals and objectives.
- Status of training in critical individual and collective tasks.
- Shortfalls in training.
- Recommendations for next training cycle (key in on correcting weaknesses).
- Results of educational programs.

Using the Principles of Exercise

As CPT Jones developed his program, he made sure he used the seven principles of exercise. He justified his program as follows:

- Balance. This program is balanced because all the fitness components are addressed. The emphasis is on building muscular endurance and strength in the skeletal muscular system because of the many lifting tasks the unit must do. The program also trains cardiorespiratory endurance and flexibility; warm-up and cool-down periods are included in every workout.
- Specificity. The unit's fitness goals are met. The sand-bag lifting and weight training programs help develop muscular endurance and strength. The movements should, when possible, stress muscle groups used in their job-related lifting tasks. Developmental stretching should help reduce work-related back injuries. The different types of training in running will help ensure that soldiers reach a satisfactory level of CR fitness and help each soldier score at least 70 points on the APFT's 2-mile run. Soldiers do push-ups and sit-ups at least two or three times a week to improve the unit's performance in these events. The competitive fitness activities will help foster teamwork and cohesion, both which are essential to each section's functions.
- Overload. Soldiers reach overload in the weight circuit by doing each exercise with an 8-to 12-RM lift for a set time and/or until they reach temporary muscle failure. For the cardiorespiratory workout, THR is calculated

initially using 70 percent of the HRR. They do push-ups and sit-ups in multiple, timed sets with short recovery periods to ensure that muscle failure is reached. They also do PRE' to muscle failure.

- Progression. To help soldiers reach adequate overload as they improve, the program is made gradually more difficult. Soldiers progress in their CR workout by increasing the time they spend at THR and up to 30 to 45 minutes per session and by maintaining THR. They progress on the weight training circuit individually. When a soldier can do an exercise for a set time without reaching muscle failure, the weight is increased so that the soldier reaches muscle failure between the 8th and 12th repetition again. Progression in push-ups and sit-ups involves slowly increasing the duration of the workout intervals.
- Variety. There are many different activities for variety. For strength and muscular endurance training the soldiers use weight circuits, sandbag circuits, and PREs. Ability group runs, intervals, Par courses, Fartlek running, and guerrilla drills are all used for CR training. Varied stretching techniques, including static, partner-assisted, and contract-relax, are used for developmental stretching.
- Regularity. Each component of fitness is worked regularly. Soldiers will spend at least two to three days a week working each of the major fitness components. They will also do push-ups and sit-ups regularly to help reach their peak performance on the APFT.
- Recovery. The muscular and cardio-respiratory systems are stressed in the alternate workouts. This allows one system to recover on the day the other is working hard.

Conclusion

CPT Jones's step-by-step process of developing a sound PT program for his unit is an example of what each commander should do in developing his own unit program.

Good physical training takes no more time to plan and execute than does poor training. When commanders use a systematic approach to develop training, the planning process bears sound results and the training will succeed.

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